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THE GASTRIC DIGESTION OF MEAT IN HEALTH AND IN DISEASE *

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Some time ago, one of us in collaboration with Fishback, Smith, Bergeim, Lichtenthaeler and Hawk,[1] published the results of a study of beef and beef products in the normal human stomach. This observation was based on seventy complete experiments on twenty-five different subjects. In this study we investigated the different forms of beef as well as various methods of meat preparations. Roast beef, hamburger steak, beefsteaks, stewed beef, boiled corned beef, dried beef and beef bologna were studied. We found that the administration of 100 Gm. of the beef products gave on an average an evacuation time of two hours and thirty-five minutes on subjects of the rapid emptying type, and three hours and twenty-five minutes on subjects with "slow" stomachs. What was more interesting was the fact that the average total acidity at the highest point of digestion was 120 degrees (hydrochloric acid), almost twice as high as the average highest total acidity with cereals and vegetables, from 70 to 80 degrees (hydrochloric acid). While the digestion time in a limited number of cases was investigated by Beaumont, Jessen and Peuzoldt, the secretory response was scarcely noted. We called attention to the high acid figures encountered with beef products in 1919. A similar type of response was obtained with pork and lamb, and to a lesser degree with fish; a rather sustained high acidity was noted with the poultry products, such as chicken and guinea-hen, but with less complex proteins, such as egg and milk, distinctly lower acid figures were obtained.

Carlson and his collaborators in studying the physiology of the gastric secretion emphasized the importance of meat as a true gastric stimulant, which, together with the factor of distensibility, represented the important elements of the "gastric" phase in the secretory output of the stomach.

As nearly as possible our original experiments were carried out on healthy students, and the results obtained indicate the normal response to meats. It was apparent from these experiments that the response to meats was far more active than that to carbohydrates. As the general profession had been dedicated to the belief that a carbohydrate meal such as toast, gruel, oatmeal and rolls was the most acceptable form of test meal, and clinical comparisons were largely based on the results of this type of test meal, it seemed of clinical importance to ascertain the alteration in the response to meat. Before going over the data that form the basis of this communication, we will present the results of our [1] secretory studies on meat digestion in normal persons as published in 1919 on beef (table 1).

Studied by the fractional method, it is apparent that not all normal stomachs react alike to beef products. Some respond very promptly and decidedly to the entrance of food, whereas others respond very slowly and indifferently to the same food. One type of normal stomach shows quick gastric digestion, while another type responds more slowly. We would emphasize these two types because they are normal variations encountered when large numbers are studied. We know of no similar contribution on the subject of meat digestion in health.

The second point of importance is shown in the accompanying diagrams illustrating the reaction of the normal stomach to different foodstuffs. It emphasizes the fact that meats induce the highest degree of acidity, and, as compared with other foodstuffs, and particularly the breadstuffs and cereals, the secretory response is altogether different. This was well illustrated in a perusal of almost a thousand complete studies on the digestion of foodstuffs in the normal human stomach.

It was our belief that as the stomach of the normal individual reacts more powerfully with meat than with breadstuffs, as demonstrated by an Ewald meal, a comparison of an Ewald meal and a meat meal in diseased subjects ought to be of considerable interest. Furthermore, we believed that certain data might be obtained which would be of value.

The following questions seemed pertinent:

1. In anacid and subacid cases in which the response would be low with an Ewald meal, if a meat meal were given and a higher response obtained, would not this favor the assumption that the mucous membrane was not organically diseased? In other words, is it not true that an organically diseased mucous membrane would fail to react to both meals?

2. Does the difference in the response to the two meals represent a potential difference in mucosal efficiency? If an individual failed to respond to an Ewald meal and did respond to a meat meal, was not the prognosis better than if a failure occurred in both responses?

3. Is it possible to prognosticate the severity of an anemia in this way?

4. What does meat do in cases of peptic ulcer?

* Read before the Section on Gastro-Enterology and Proctology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 15, 1928.

1. Rehfuss, M. E.; Fishback, H. R.; Smith, C. A.; Bergeim, Olaf; Lichtenthaeler, R. A., and Hawk, P. B.: Am. J. Physiol. **49**: 174 (July) 1919.

In order to make a more intelligent comparison, we were compelled to modify our technic. Instead of using 100 Gm. of meat, which was the basis of our studies on healthy men, we used 60 Gm. of scraped meat, which more nearly approximated the Ewald meal.

RESULTS OF BEEF TEST MEAL

It might be well to enumerate in some detail some of the results obtained before drawing deductions. The following cases represent a cross-section of varied medical conditions that occurred in our medical service and were selected because the patients were diseased.

TABLE 1.—*Response of the Human Stomach to Beef and Beef Products* *

Sub-ject No.		Food and Preparation	Type of Stomach: Rapid Emptying Type — Evacuation Time, Hours and Minutes		Rapid Emptying Type — Highest Total Acidity*		Slow Emptying Type — Evacuation Time, Hours and Minutes		Slow Emptying Type — Highest Total Acidity*	
				Average		Average		Average		Average
1	Tri	Roast beef rare	2:45	....	70	...	....	....	...	...
2	Ri	Roast beef rare	2:00	....	110	...	....	....	...	...
3	Joa	Roast beef rare	2:45	....	90	...	....	....	...	...
4	Cru	Roast beef rare	2:30	....	120	...	....	....	...	...
5	Gl	Roast beef rare	2:45	2:30	110	102	....	....	...	...
6	Sim	Roast beef rare	....	....	...	...	3:30	....	120	...
7	Re	Roast beef rare	....	....	...	...	2:45	....	130	...
8	Wal	Roast beef rare	....	....	...	...	2:30	....	130	...
9	Oa	Roast beef rare	....	....	...	...	2:00	3:00	112	120
10	Ara	Roast beef medium	1:45	....	122	...	....	....	...	...
11	Bos	Roast beef medium	2:45	2:15	122	122	....	....	...	...
12	Sim	Roast beef medium	....	....	...	...	3:15	....	120	...
13	Ral	Roast beef medium	....	....	...	...	3:45	....	108	...
14	Kon	Roast beef medium	....	....	...	...	3:15	3:30	110	113
15	Ri	Roast beef well done	2:00	....	105	...	....	....	...	...
16	Lun	Roast beef well done	2:30	2:15	123	114	....	....	...	...
17	Ca	Roast beef well done	....	....	...	...	3:30	....	131	...
18	Con	Roast beef well done	....	....	...	...	3:45	....	126	...
19	Joe	Roast beef well done (250 Gm.)	....	....	...	...	3:15	....	128	...
20	Ne	Roast beef well done (250 Gm.)	....	....	...	...	3:45	3:30	164	138
21	Con	Roast beef well done (250 Gm.)	....	....	...	...	5:45	5:45	138	138
22	Hou	Steak hamburger round raw	....	....	...	...	3:00	....	110	...
23	Sim	Steak hamburger round raw	....	....	...	...	3:00	3:00	113	111
24	Mor	Steak hamburger round (well done)	2:00	2:00	98	98	....	....	...	...
25	Kon	Steak hamburger round (well done)	....	....	...	...	3:00	....	118	...
26	Lee	Steak hamburger round (well done)	....	....	...	...	3:00	3:00	120	119
27	Ri	Steak hamburger chuck well done	2:00	2:00	109	109	....	....	...	...
28	Joa	Steak rump tough rare	2:00	....	95	...	....	....	...	...
29	Tri	Steak rump tough rare	2:30	2:15	135	115	....	....	...	...
30	Joa	Steak rump well done	2:00	....	93	...	....	....	...	...
31	Tri	Steak rump well done	2:45	2:30	153	123	....	....	...	...
32	Swe	Steak shank tough well done	2:30	2:30	111	111	....	....	...	...
33	Con	Steak shank tough well done	....	....	...	...	3:45	3:45	126	126
34	Aar	Steak sirloin medium	3:00	3:00	128	128	....	....	...	...
35	Kna	Steak sirloin medium	....	....	...	...	3:45	3:45	135	135
36	Joa	Steak sirloin well done	2:15	....	118	...	....	....	...	...
37	Kli	Steak sirloin well done	3:00	3:10	131	125	....	....	...	...
38	Joa	Steak tenderloin medium	3:30	3:30	98	98	....	....	...	...
39	Tri	Steak sirloin well done	3:30	3:30	168	168	....	....	...	...
40	Oa	Steak sirloin planked medium	....	....	...	...	3:00	....	151	...
41	Mab	Steak sirloin planked medium	....	....	...	...	3:00	3:00	144	147
42	Cla	Steak sirloin planked well done	....	....	...	...	3:15	3:15	79	79
43	Joa	Steak tenderloin planked medium	3:00	3:00	92	92	....	....	...	...
44	Wal	Steak round boiled	....	....	...	...	3:45	3:45	139	139
45	Ne	Stewed beef	....	....	...	...	3:15	....	88	...
46	Ral	Stewed beef	....	....	...	...	4:15	3:45	107	100
47	Ral	Stewed beef (250 Gm.)	....	....	...	...	6:00	....	147	...
48	Ne	Stewed beef (250 Gm.)	....	....	...	...	5:30	5:45	117	123
49	Ara	Dried beef	2:15	2:15	129	120	....	....	...	...
50	Bec	Dried beef	....	....	...	...	2:45	3:45	90	90
51	Bec	Beef tongue boiled	....	....	...	...	4:30	....	139	...
52	Kar	Beef tongue boiled	....	....	...	...	4:00	4:15	131	145
53	Lun	Corned beef boiled	2:45	2:45	77	77	....	....	...	...
54	Sim	Corned beef boiled	....	....	...	...	3:30	3:30	125	...
55	Wal	Corned beef boiled	....	....	...	...	3:45	3:30	125	125
56	Cru	Bologna	2:45	....	130	...	....	....	...	...
57	Bos	Bologna	2:30	2:45	105	118	....	....	...	...
58	Ara	Liver, calf's, fried	2:30	....	110	...	....	....	...	...
59	Bos	Liver, calf's, fried	3:15	2:45	135	122	....	....	...	...
60	Gl	Frankfurters (80 Gm.)	2:15	....	118	...	....	....	...	...
61	Ca	Frankfurters	2:45	2:30	109	114	....	....	...	...
62	Spk	Sweetbreads	2:15	2:15	85	85	....	....	...	...
63	Tri	Tripe	3:30	3:30	125	125	....	....	...	...
64	Oa	Tripe	....	....	...	...	3:15	3:15	110	110

* Acidity expressed in cubic centimeters of tenth-normal alkali required to neutralize 100 cc.

TABLE 2.—*Highest Total Acidity for Various Articles of Diet* *

Articles of Diet (100 Gm. Portions Unless Otherwise Stated)	Number of Observations	Highest Total Acidity (Aver.) (Cc. N/10 Alkali to Neutralize 100 Cc. of Juice)
Beef and beef products	25	120.0
Lamb and lamb products	14	135.0
Veal †		
(*a*) Market	7	140.0
(*b*) "Bob"	7	110.0
Pork and pork products	31	120.0
Chicken †	20	125.0
Turkey †	2	140.0
Guinea hen †	2	110.0
Fish †	75	130.0
Milk †		
Cows':		
400 cc.	50	100.0
75 cc.	3	45.0
Mothers':		
150 cc.	5	60.0
225 cc.	2	90.0
Gelatin † (fruit juice preparations)	5	70.0
Egg and egg combinations	90	80.0
Vegetables prepared in different ways	124	75.0
Fruits †	68	90.0
Bread and cereals	75	80.0
Cakes	29	90.0
Pies	29	90.0
Puddings	23	90.0
Sugars and candies	28	70.0
Ice cream †	7	105.0
Ices †	4	65.0
Nuts † (25 to 50 Gm.)	22	100.0

* These are the complete tables up to date as about to be published by Rehfuss, Bergeim and Hawk.
† Unpublished data.

Anemias.—In a case of posterolateral sclerosis with pernicious anemia, we were unable to elicit a mucosal response with either meat or toast. The response was almost identical in the two instances, namely, a flat anacidity, suggesting that the mucosa was ineffective to both, and that serious mucosal impairment was present.

In another patient, Mrs. D., who had had twenty-nine transfusions and who was sustained only by liver

TABLE 3.—*Evacuation Time for Various Articles of Diet* *

Articles of Diet (100 Gm. Portions Unless Otherwise Stated)	Number of Observations	Evacuation Time (Hours and Minutes) Type of Stomach: Rapid Emptying	Slow Emptying	Average
Beef and beef products	25	2.35	3.25	3.00
Lamb and lamb products	14	2.30	3.20	3.00
Veal:				
(*a*) Market	7	....	....	2.50
(*b*) "Bob" †	7	....	....	3.20
Pork and pork products	31	2.45	3.40	3.15
Chicken †	20	2.45	3.45	3.15
Turkey †	2	3.00	3.45	3.30
Guinea hen †	2	....	4.00	4.00
Fish †	75	....	....	2.50
Milk: †				
Cows':				
400 cc.	50	....	....	2.30
75 cc.	3	....	....	1.15
Mothers':				
150 cc.	5	....	....	1.40
225 cc.	2	....	....	2.25
Gelatin †	5	....	....	2.00
Egg and egg combinations	90	2.15	3.15	2.40
Vegetables prepared in different ways	24	2.00	2.30	2.50
Fruits †	68	1.35	2.20	2.00
Bread and cereals †	75	....	....	2.40
Cakes	29	....	....	3.00
Pies	29	....	....	2.30
Puddings	23	....	....	2.30
Sugars and candies	28	....	....	2.05
Ice cream †	7	....	....	3.15
Ices †	4	....	....	2.35
Nuts: †				
(*a*) 25 Gm.	18	....	....	3.00
(*b*) 50 Gm.	4	....	....	4.00

* These are the complete tables up to date as about to be published by Rehfuss, Bergeim and Hawk.
† Unpublished data.

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therapy, there had never been the typical acidity of pernicious anemia. She responded with a high total acidity and no free hydrochloric acid to meat. The blood picture was typically pernicious, but the onset of the disease with violent gastro-intestinal symptoms and hemorrhage was atypical. Even at this late date, and the patient has been under observation many years, we still feel that there is a question regarding her status.

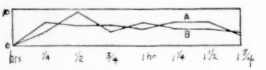

Chart 1.—Result of the administration of a meat meal and an Ewald meal in a patient with pernicious anemia and subacute degeneration of the cord. Notice the complete failure of the mucosa to respond to either meal. *A*, Ewald meal; *B*, meat meal.

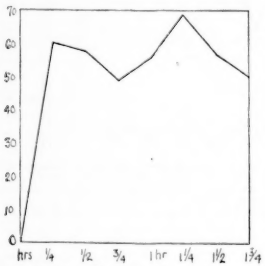

Chart 2.—Total acidity with a meat meal obtained in a patient who had twenty-nine transfusions and many of the signs of pernicious anemia; no free hydrochloric acid. She gave a negative response with an Ewald meal.

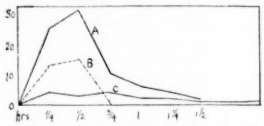

Chart 3.—Result on a patient with gastritis, mild secondary anemia, focal infections, arthritis and narrowing of the right ureter. Result suggests defective mucosal function. *A*, total acidity, meat; *B*, free acidity, meat; *C*, Ewald meal: anacidity; no free acid.

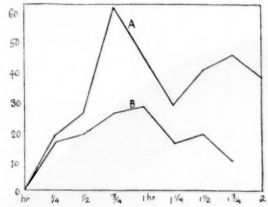

Chart 4.—Total acidity (*A*, meat, *B*, Ewald meal) in an advanced case of myelogenous leukemia. Notice defective response to both meat and toast.

E. M., a woman, with a secondary anemia and pelvic complications, showed anacidity with an Ewald meal, but the mucosa responded in a partial manner to meat. Every detail in the report of this case justified the belief that the patient had a mild secondary anemia with foci of infection. She also had a narrowing of the right ureter, and there were some arthritic phenomena.

Leukemia.—We tested two patients with this condition, both myelogenous in type. In an advanced case there was a subacid response with an Ewald meal, and a more marked but still subacid response as compared with normal with a meat meal.

In an early case with a prostatic complication and hematuria, the Ewald and meat meal responses were similar to that encountered in health (Ewald highest total acidity 58, free acidity 34; meat total acidity 105, free acidity 65). Whether these forms of leukemia eventually induce mucosal disturbances is not clear, but in the early case impairment was not noted.

Cardiac Cases.—Several cases of chronic cardiac disease were studied. In one patient, A. W., a man, aged 59, with marked enlargement of the heart, double murmurs, both aortic and mitral, marked aortic regurgitation, myocardial degeneration and auricular fibrillation, the Ewald and meat meals gave low but definite mucosal responses (Ewald highest total acidity 47, free acidity 12; meat total acidity 66, free acidity 8).

In another case of double aortic disease with myocarditis and syphilis, normal responses were obtained (Ewald highest total acidity 51, free acidity 36; meat highest total acidity 108, free acidity 56).

In another patient with aortic stenosis, polycythemia (red blood count, 8,320,000) and an enlarged spleen, similar figures were obtained, the meat figures almost doubling those obtained with an Ewald meal (Ewald highest total acidity 50, free acidity 19; meat total acidity 108, free acidity 33). One of us has examined the stomach in decompensation, and the common finding is a falling off of the secretory output. These observations suggest that these forms of cardiac disease in compensation are associated with normal gastric function. We have encountered marked hyperacidity in aortic regurgitation.

Renal Disease.—In one patient with renal disease the response for meat was almost double that of the Ewald meal (Ewald highest total acidity 55, free acidity 8; meat total acidity 107; free acidity 33). Subacidities, however, are not uncommon in advanced nephritis.

Pulmonary Disease.—In one advanced case of pulmonary tuberculosis with cavity formation and chronic gastritis there was no free acid with either meal, but the highest total acid figures were obtained with the meat meal.

Gallbladder Disease.—While there is a marked difference of opinion in regard to the gastric analytic manifestations of gallbladder disease, and one of us has observed as many subacid as hyperacid responses, the differences are to be explained on the basis of the great clinical variations associated with disease in that organ. In one group there is well marked gastritis,

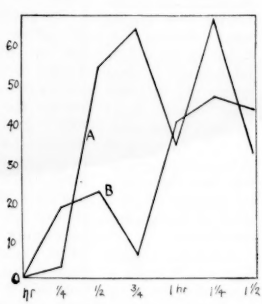

Chart 5.—Response to both test meals (*A*, meat, *B*, Ewald) in a patient with advanced mitral and aortic disease, with fibrillation and an old osteoarthritis.

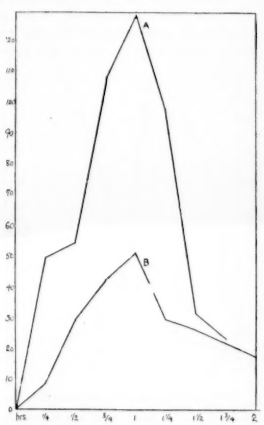

Chart 6.—Total acidity (*A*, meat, *B*, Ewald) in a case of syphilitic aortitis. Notice practically normal response to both meals.

in some pancreatitis and colitis, and in nearly all foci of infection. We studied three patients with both meals in whom there was a positive cholecystogram, and in all three of whom clinical study confirmed the diagnosis.

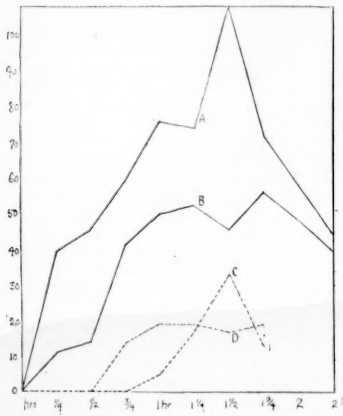

Chart 7.—Polycythemia with aortic stenosis. Note normal type of response to both meat meals. *A*, meat; *B*, Ewald; *C*, free acidity, meat; *D*, free acidity, Ewald.

In one case (W. S.) of calculous cholecystitis with mouth infection, anacidity with an Ewald meal was associated with an almost similar response with a meat meal (Ewald highest total acidity 8, free acidity 0; meat total acidity 12, free acidity 6).

In a second patient with cholangeitis and cholecystitis (Ewald total acidity 48, free acidity 22; meat total acidity 59, free acidity 22) the responses to both meals were subnormal. There was also rather marked ptosis.

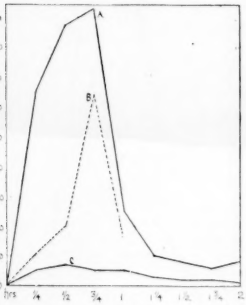

Chart 8.—Patient with cholecystitis, appendicitis, gastritis and sinusitis. Note low response with an Ewald meal and very much better response to a meat meal. *A*, total acidity, meat; *B*, free acidity, meat; *C*, Ewald meal.

In a third patient with pericholecystitis, duodenal adhesions and sinus infection the Ewald meal showed almost anacidity (total acidity 7, free acidity 3) and the meat meal total acidity 93, free acidity 63, a marked difference, suggesting that there was no serious impairment of the mucous membrane.

Exophthalmic Goiter.—There is a great difference of opinion regarding the gastric secretory observations in this disease. Moll and Scott found only thirteen out of fifty as normal or high normal in type, while twenty-two were achlorhydric and fifteen hypochlorhydric. Our own experience suggests the frequency of a low acid output. In the patient, however, whom we studied, A. M., a woman, an Ewald meal gave as the highest total acidity, 117, with free hydrochloric acid 100, and meat gave 174 total acidity and 87 free acidity, figures which were the highest encountered in this series. The basal metabolic rate was 41 and the patient was definitely in a hyperthyroid cycle with classic symptoms and indigestion relieved by food.

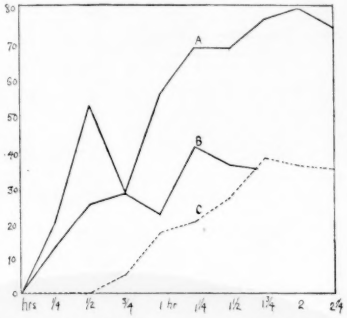

Chart 9.—Chronic cholecystitis. Ewald meal was given between the attacks and the meat meal after an attack. Note inverse curve probably due to the effect of the acute exacerbation on mucosal activity. *A*, Ewald total acidity between attacks; *B*, meat meal after an attack; secretion scanty; no free acid; food in stomach more than three and one-half hours.

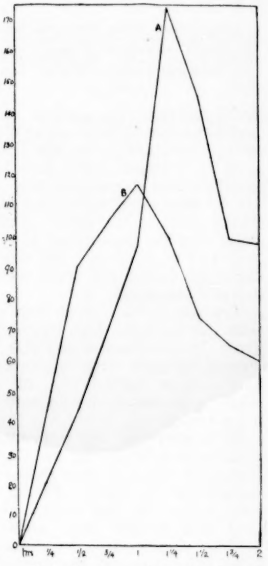

Chart 10.—Total acidity (*A*, meat, *B*, Ewald) in a patient with exophthalmic goiter. Basal metabolic rate, plus 41. Note exaggerated response to both meals, suggesting exaggerated mucosal function or defective acid regulation in both instances.

Malignancy.—We are not yet ready to report on these cases. In one case of diffuse scirrhous carcinoma of the stomach with anacidity, the figures were slightly higher with a meat meal.

In another case of diffuse metastasis to the chest from a primary pancreatic carcinoma the Ewald meal gave total acidity 43, free acidity 33; the meat meal total acidity 58, free acidity 32. In the experience of one of us, gastric secretion is maintained until late in the disease in pancreatic carcinoma. The study of meat digestion in gastric carcinoma will form a separate contribution which we hope to report subsequently.

Peptic Ulcer.—This condition is of considerable interest. In a large posterior penetrating gastric ulcer, sub-

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sequently removed at operation, an Ewald meal showed delayed evacuation, blood in all samples, and a highest total acidity figure of 58, with free acidity 37. The meat meal recorded more than double the acidity with a highest total acid figure of 125 and free acid 53, and the same delay.

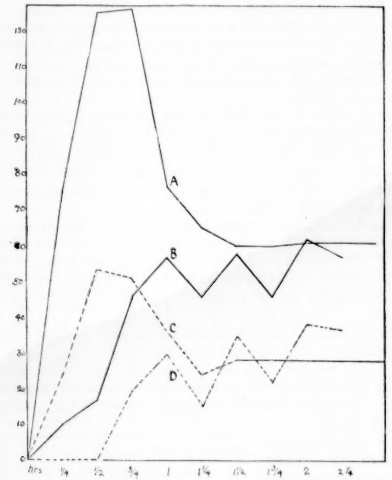

Chart 11.—Result obtained in a case of chronic posterior perforating ulcer subsequently verified at operation. *A*, total acidity, meat; *B*, total acidity, Ewald; *C*, free acidity meat; *D*, free acidity, Ewald.

acidity reaching 141 and the free acidity reaching only 46, but digestion was not over in three and three-fourths hours.

In two other cases, the total acid response to meat was appreciably higher, and in one of these the same delay in evacuation occurred.

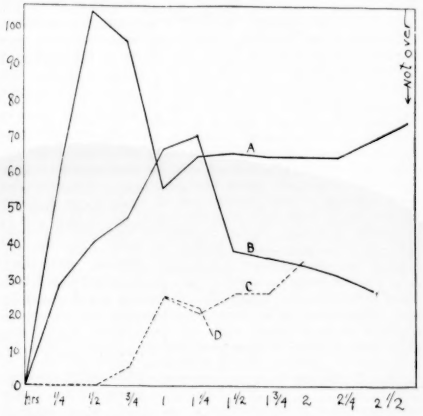

Chart 13.—Patient with duodenal adhesions and gastric delay more pronounced with a meat meal. *A*, total acidity, meat; *B*, total acidity, Ewald; *C*, free acidity, meat; *D*, free acidity, Ewald.

Several other cases were of interest. In one instance of lobar pneumonia with delayed resolution, anacid

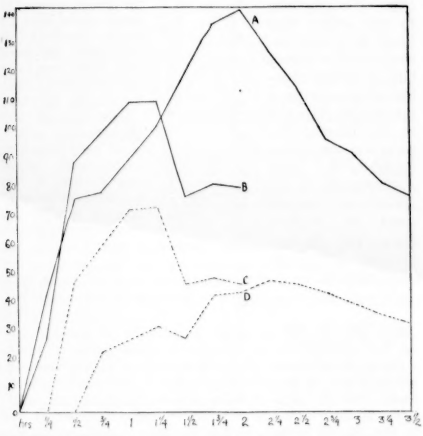

Chart 12.—A case of stenosing duodenal ulcer with hypersecretion. Note the prolonged response obtained with meat. *A*, total acidity, meat; *B*, total acidity, Ewald; *C*, free acidity, Ewald; *D*, free acidity, meat.

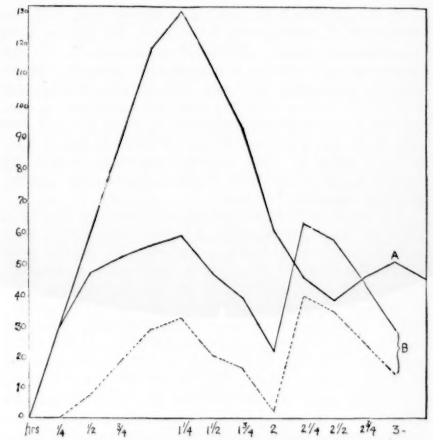

Chart 14.—Atonic dilatation of the stomach with a duodenal kink. Digestion prolonged in both instances. *A*, meat; *B*, Ewald.

In a stenosing duodenal ulcer with hypersecretion the difference in the two meals was apparent (Ewald highest total acidity 108, free acidity 72) and was over in two and one-half hours. The meat meal produced a much higher and more prolonged response, the total responses were obtained with both the Ewald and the meat meals. This is interesting in view of the fact that one of us by a different method showed a falling off in secretory output following some acute infections, notably influenza.

In another long case of bacterial endocarditis (S. R.) an Ewald test meal showed a hyperacid response (highest total acidity 105, free acidity 67) and later when the disease was developed a meat meal showed total acidity 26, and free acidity 20. The patient was too sick for us to try the Ewald meal again, but postmortem examination revealed inflammatory changes in the digestive tract, presumably acute or subacute in type. It is interesting to note that this was the only case in which the observations were reversed. In one case of cholecystitis, however, the meat meal was given immediately after an attack and the response was lower than with an Ewald test meal given before the attack.

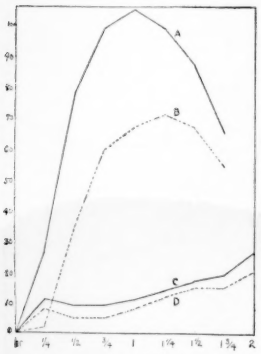

Chart 15.—Response in a case of bacterial endocarditis. The Ewald meal was taken five weeks before death and the meat response was taken shortly before death. *A*, total acidity, Ewald; *B*, free acidity, Ewald; *C*, total acidity, meat; *D*, free acidity, meat.

In almost all cases both test meals were administered within forty-eight hours of each other. In a case of Buerger's disease with endarteritis obliterans, Ewald and meat meals gave almost similar responses (Ewald highest total acidity 48, free acidity 34; meat total acidity 49, free acidity 17.

SUMMARY

It is apparent from this short survey that, with the exception of the patients with ulcer, the patient with exophthalmic goiter, and another patient, N. C., not mentioned, who had a psychasthenic condition without organic lesion that we could demonstrate (Ewald total acidity 78, free acidity 56; meat total acidity 153, free acidity 66), the general response to meat was not that which we have encountered normally. It seems altogether probable that serious systemic disease by impaired gastric function likewise impairs the normal mucosal function for meat.

Exclusive of those with ulcer, but including all others, these diseased patients gave a highest total acidity with a meat meal of 66.5 and a highest total acidity with an Ewald meal of 40, figures which are appreciably lower than those obtained in normal individuals. We do not believe that this finding is true of the ulcer group, nor is it true of the patients in whom simply functional rather than organic disease is present. Many other points remain for study, such as the actual sequence of meat digestion in disease, the microscopic variations that occur, and the significance of these changes in disease.

CONCLUSIONS

1. In the diseased patient as exemplified by the chronic invalid with cardiac or renal disease, blood dyscrasia, and other conditions commonly encountered in medical ward service, the gastric digestion of meat is somewhat impaired.

2. The results recorded were obtained after the ingestion of 60 Gm. of scraped meat, as compared with normal studies that were done with 100 Gm. portions. The significance of this was not determined experimentally, but it is probable that figures somewhat lower are obtained when smaller quantities of meat are ingested.

3. In purely functional conditions and probably with peptic ulcer, meat digestion is not impaired so far as the secretory function is concerned.

4. We would emphasize the necessity of examining all persons who show a minimal secretory response with an Ewald meal and a meat meal. In a certain proportion of cases the responses are prompt and direct with meat. In our judgment such a response offers a better prognosis.

5. Failure to respond to both an Ewald meal and a meat meal may be of serious prognostic importance. We encountered this lack of response in pernicious anemia and gastric carcinoma. On the other hand, it was seen also in delayed resolution in lobar pneumonia and in chronic cholecystitis.

6. A failure to respond to an Ewald meal is much more common than failure to respond to a meat meal.

7. We believe that there is a normal difference in the total acidity produced by meats and breadstuff, in favor of the former to the extent of probably 30 per cent or more.

8. Persons giving a similar response to bread and meat cannot be considered normal.

9. We believe that the use of the two meals gives more reliable evidence of mucosal efficiency, particularly when subacid or anacid responses are obtained with an Ewald meal.

10. The explanation of the greater response of the normal stomach is not attempted in this communication. We subscribe to the belief that meat is a true intragastric stimulant, in health capable of producing a maximum response on the part of the gastric mucous membrane. That this response is altered in disease must be evident from the limited number of cases here studied.

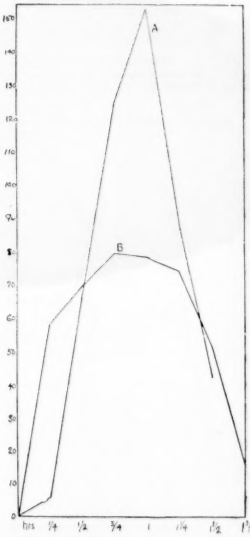

Chart 16.—Meat response as compared with the Ewald meal response in a case of gastric hyperacidity in which no evidence of an organic lesion was found. *A*, total acidity, meat; *B*, total acidity, Ewald.

ABSTRACT OF DISCUSSION

DR. C. B. WRIGHT, Minneapolis: I was struck with the similarity of these curves to the curves I obtained by the use of histamine. A rapid rise and a maximum curve appeared in about twenty minutes. I have been using histamine in cases of achylia and have found cases showing no free hydrochloric acid in the ordinary fractional test meal which show acid after histamine. The similarity of these curves to the curves which the authors obtained with the meat meal suggested that

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there might be a histamine effect from the meat meal, as histamine results from protein decomposition. I have been using 0.5 mg. of histamine as a routine and find it a very simple test to give. I have not had any trouble in its use, except for a slight headache lasting only a few minutes. If this is a test for true achylia, it will be useful. In seriously ill patients, however, histamine should not be used. Drs. Rehfuss and Marcil have added much to our knowledge of gastric secretion, and are adding still more. Studies of this kind help us both in understanding disease and in treating it intelligently.

DR. FRANK SMITHIES, Chicago: From a large experience in test meal analysis, I may say that our conclusions are similar to those of the authors. I have discarded almost entirely the attempt to determine the secretory response of the stomach to the ordinary Ewald meal or one of its modifications. Except when acute disease is suspected, we put our patients' stomachs at work by means of a regular dinner which is high in protein. An explanation for some of the increased secretion values shown by Drs. Rehfuss and Marcil lies, I think, in the fact that meat actually puts the stomach to work and keeps it working. Prolonged work brings a greater quantity of blood to the stomach wall and there follows a greater volume of secretion over a relatively long period. Hewlett, in his studies with the plethysmograph on the effects of irritation and work on the muscles of the arm, observed precisely this type of increased vascular response. The more vigorous the effort and the longer its duration, the greater the volume of blood present in the blood vessels. I wish to call attention also to the fact that the common peptic ulcer treatment is a high protein meal. The authors' table shows that milk and eggs gave high acid values and also delayed the emptying time. One can derive, I think, a therapeutic suggestion from these figures. Were it not that in the Sippy treatment the milk and eggs are not digested because the patient is kept alkalized, that such foods require an acid medium for their splitting, and that the stomach is lavaged to relieve it of residues, very likely there would occur a serious impairment of function as a consequence of exhibiting such unphysiologic diet.

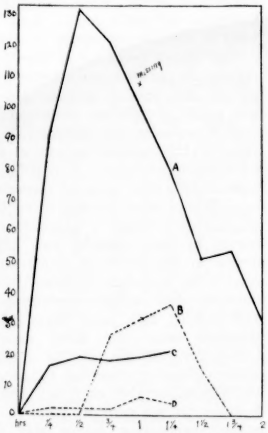

Chart 17.—Interesting response in a patient under treatment for a gastric ulcer in whom the niche disappeared. A defective response to an Ewald meal before treatment. *A*, total acidity, meat; *B*, free acidity, meat; *C*, total acidity, Ewald meal; *D*, free acidity, Ewald.

DR. GEORGE B. EUSTERMAN, Rochester, Minn.: The observations on gastric digestion reported by Dr. Rehfuss and his colleagues have a practical bearing. It permits one to detect a spurious achylia, and to differentiate achlorhydria and anacidity on the basis of the physiologic principle stated by the authors that an adequate stimulus elicits an adequate response. For example, anacidity or subacidity is unusual in the presence of recurrent benign ulcers. In a number of such actual or probable recurrent benign ulcers, while determining gastric motility by a large mixed or Riegel meal in patients with achlorhydria after the usual test meal, we found that by introducing and leaving the tube until the stomach had emptied, the successive aspirations usually revealed normal or hyperacid values. This form of examination might be used in all cases of achlorhydria and if free hydrochloric acid is demonstrable histamine studies or hydrogen ion concentration determinations are unnecessary.

DR. MARTIN E. REHFUSS, Philadelphia: For a number of years we have been trying not to listen to fads or theories, but we are putting the tube down into the stomach to find out what is going on, and I don't believe that there is any other way to find out. I know that histamine is a gastric stimulant, but it was not used for that purpose in this examination. We are simply trying to find out how the diseased stomach digests meat. The stomach is not the only organ digesting meat. It is a long study down through the 30 feet feet of bowel. It is extraordinary how meat is digested. It is broken down into at least four strata which are readily recognized microscopically. I do not propose to discuss that now. Another question came up with regard to the use of the test ulcer of the stomach. I know that all meat in the protein group produces high acidities. Meats also, curiously enough, have great combining power. If our tabulations are studied, it will be observed that even the free acid was very high in meat in normal students. Another question concerns the foods that produce the lowest secretions. A carbohydrate meal produces the lowest secretions. We studied enterogastric carcinoma and found some very interesting things in this regard. It was obvious, from a complete study of all foods in the human stomach, that these foods brought about the maximum stimulation and the maximum amount of work on the part of the stomach. How they do it and why they do it are other questions. Furthermore, we thought that taking two meals and estimating them would be a good test of the efficiency of the human gastric mucous membrane, and this was certainly borne out by our studies. The other point brought out by these observations is that the chronically diseased patients in a medical ward, at least many of them, begin with insufficient gastric function; whether they have insufficient pancreatic and intestinal function I am not sure, but I know that a careful curtailment of the diet in some of these cases may depend on that factor, although for other reasons it may be necessary to eliminate meat.

ROUTINE USE OF THE VITAMIN B FACTOR IN INFANT FEEDING*

ROGER H. DENNETT, M.D., D.Sc.
NEW YORK

My object in this paper is to report a study of 150 infants fed as a routine with food containing a sugar rich in the vitamin B factor.

It has long been the observation of clinicians that there comes a period in the life of many artificially fed, and even breast fed infants, often at from 5 to 10 months of age, when there is evidence of some vitamin deficiency. These are infants who have been properly fed with foods which according to our present standards are thought to be correct, and who have had cod liver oil and orange juice and therefore were properly supplied with vitamins A, C and D. Such infants may cease to gain properly in weight, becoming fretful and restless or pale; some of them have anorexia, and others seem to fail to assimilate their food properly. It has been suspected but difficult to prove that vitamin B was the factor in this deficiency. Vitamin B is the chief growth factor in foods and is said to be composed of two factors: one undestroyed by heat, called the pellagra-preventing (P. P.), and the other the antineuritic factor which prevents neuritis, stimulates the appetite, and is destroyed by heat. Yeast contains both vitamin B factors in concentrated form and has been used by laboratories in animal experiments as a standard of vitamin B. The germ of cereals, particularly wheat germ containing vitamin B in concentrated form, is also very potent, while green vegetables supply vita-

* From the Pediatric Department of the New York Post-Graduate Medical School and Hospital.

min B in lesser quantities. Milk was formerly thought to contain vitamin B in sufficient quantities to supply the needs of the average infant.

In 1926, Hoobler and his co-workers [1] showed that breast milk cannot be relied on to supply the optimal quantity of the antineuritic substance and that a child fed on the breast may be receiving subminimal amounts of vitamin B. In 1927 Outhouse, Macy and their co-workers [2] showed in experiments with rats that both breast milk and cow's milk may fail to supply the optimal quantity of vitamin B. Their animals showed an interruption of growth after twelve weeks' feeding with 20 cc. of cow's milk as the sole supply of vitamin B in their diet. At the end of this twelve week period 0.4 Gm. of fresh dried yeast fed to the animals daily brought about an immediate response in growth. These animal experiments convinced clinicians that bottle fed babies need more of the vitamin B factor than is contained in the usual cow's milk, cereal (most often refined barley) and sugar mixtures. The recent quantitative work of Macy, Outhouse, Graham and Long showed that pooled human breast milk taken from individuals subsisting on the average American diet is markedly deficient in vitamin B and these investigators suggest that every infant, breast or artificially fed, should receive some supplementary vitamin B product early in the nursing period.

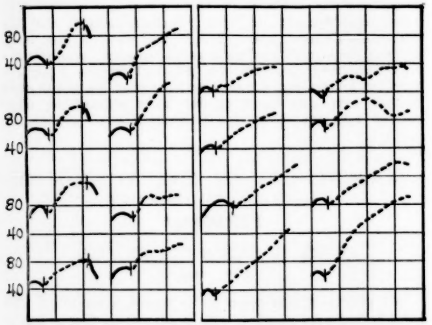

Chart 1.—Antineuritic vitamin assay: Basal diet (shown by solid line): casein (purified), 18 per cent; starch (purified), 54 per cent; salt mixture (McCollum 185), 4 per cent; agar-agar, 2 per cent; crisco, 15 per cent; cod liver oil, 2 per cent; autoclaved yeast, 5 per cent. Growth during the administration of 0.1 Gm. of wheat germ sugar daily in the first four rats (shown in the first column) is practically equivalent to growth similarly produced in the last four rats (shown in second column) by the addition of 9 cc. of milk to the daily basal ration.

Chart 2.—Pellagra-preventing factor assay: Basal diet (shown by solid line): casein (purified), 18 per cent; starch (purified), 59 per cent; agar-agar, 2 per cent; salt mixture (McCollum 185), 4 per cent; crisco, 15 per cent; cod liver oil, 2 per cent. Growth during the administration of 0.3 Gm. of wheat germ sugar daily in the first four rats (shown in first column) is practically equivalent to growth similarly produced in the last four rats (shown in second column) by the addition of 9 cc. of milk to the daily basal ration.

In a recent article Hoobler [3] reported feeding concentrated brewers' yeast, one-half teaspoonful daily, to infants suspected of receiving an insufficient amount of vitamin B, and such symptoms as disappeared were considered to be due to the lack of vitamin B in their original diet. He describes a group of symptoms appearing in infants believed to be on a diet partially deficient in vitamin B which disappear without any other change being made in the diet when this yeast is given. This symptom complex consists of (1) anorexia; (2) loss of weight; (3) spasticity of the arms and legs; (4) rigidity of the neck, and (5) restlessness and fretfulness, with accompanying pallor and a low percentage of hemoglobin. Hoobler believes that every infant should have an addition of vitamin B to its formula and should not depend on milk, either human or cow's, as its only source of this vitamin, just as one gives regularly orange juice and cod liver oil.

My observations during the last year and a half on 150 infants, each fed over a varying period of from two to ten months with a food rich in vitamin B, have led me to the same conclusion. In 1915 McCollum and Davis [4] showed that the embryo or wheat germ was rich in antineuritic substance. Recently the idea was conceived that a sugar, dextrin and maltose, which was made from the germ of the wheat rather than from the refined cereal, would supply any possible vitamin B deficiency of cow's milk. Such a sugar was the one used in these experiments.

The wheat germ sugar that I have used [5] contains maltose 38 per cent, malto-dextrins 20 per cent, dextrins 20 per cent, soluble proteins 8 per cent, soluble amino and other nitrogenous substances 7 per cent, mineral salts 4 per cent and moisture 3 per cent. Its caloric value is 110 calories an ounce, 3 level tablespoonfuls constituting an ounce. It is palatable, tasting more like malted milk than most of the other malt sugars. Rat experiments have shown it to be extremely rich in vitamin B. Chart 1 gives the comparative growth curves of rats, showing this sugar to contain from ninety to 100 times as much antineuritic vitamin as good milk, and chart 2, from twenty-five to thirty-five times as much pellagra-preventing factors as does good milk. The milk used was fresh, raw, herd milk obtained from the dairy department of Rutgers University. In the test for antineuritic vitamin, adequate pellagra-preventing factor was assured by the addition to the diet of 5 per cent yeast autoclaved to destroy the antineuritic factor. In the test for the pellagra-preventing factor this sugar supplied both the antineuritic and the pellagra-preventing factors. The antineuritic factor of this sugar was also demonstrated with pigeons, which showed loss of weight and polyneuritis on a diet deficient in vitamin B, and on the twenty-sixth day, when a few drops of concentrated aqueous solution of the sugar was given, made a speedy recovery from polyneuritis. Four days later, when 5 per cent of the sugar was added to the diet, a rapid gain in weight took place. In fact, all of the sugar used has been assayed to make it conform to the vitamin B standard.

Assuming that Macy is correct in stating that the average cow's milk does not supply the optimal quantity of vitamin B, and her work has been verified by others, what other sources of this factor are available in foods for infants up to the weaning period? The unit of vitamin B used by Sherman is that amount which, when fed as a prophylactic daily allowance, results in net maintenance of a standard rat over an eight weeks' period under standard conditions. Sher-

1. Hoobler, B. R.; Macy, Icie G., and Outhouse, Julia: Tr. Am. Pediat. Soc. **38:** 38, 1926.
2. Outhouse, Julia; Macy, Icie G.; Graham, Alice; and Long, M. Louisa: J. Biol. Chem. **73:** 189 (May) 1927.
3. Hoobler, B. R.: Symptomatology of Vitamin B Deficiency in Infants, J. A. M. A. **91:** 307 (Aug. 4) 1928.
4. McCollum and Davis: J. Biol. Chem. **23:** 231, 1915.
5. The wheat germ extract used in these studies was supplied by E. R. Squibb & Sons, New York, and since this work was completed has become available commercially as Vitavose. See New and Nonofficial Remedies, J. A. M. A. **91:** 28 (July 7) 1928.

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man [6] gives the following figures in units of the vitamin B value of foods that are commonly used in infancy: orange juice, "about" 9 units per ounce; milk, 9 units; tomato, from 8 to 16 units; lemon juice, 10 units; egg yolk, 50 units; spinach, from 20 to 24 units; raw peas, 60 units; potatoes, 8 units, and dry prunes, 38 units. By the curative method (chart 1) 0.1 Gm. of this wheat germ sugar (assaying 280 units antineuritic factor per ounce) gave recovery practically equivalent to 9 cc. of milk, showing the wheat germ sugar to have approximately ninety to a hundred times the antineuritic potency of milk. It also has approximately thirty times the pellagra-preventing potency of milk (chart 2). The question then arises how the optimal vitamin B may best be supplied to the infant. Yeast as used by Hoobler is certainly an excellent source of this factor, although it is not always easily obtainable in its proper form nor as easy to administer as wheat germ sugar. Orange juice and lemon juice, having the same vitamin B value as milk, cannot possibly supply the optimal quantity if milk does not. I myself am much opposed to the too early feeding of vegetables, because I have found that they often cause digestive disturbances; they are unwillingly taken by small infants, and often pass through in the stools without adequate absorption of the vitamin or other food elements. Wheat germ sugar would seem to be the ideal method of supplying this vitamin.

The wheat germ sugar used in these experiments is extremely well borne by the average infant who can take other sugars composed of dextrin and maltose. It is, however, more laxative than other malt sugars; that is, it is believed that the husk and the germ of cereals are laxative not entirely because of the roughage factor but because of some other unidentified chemical substance. This laxative action is extremely valuable in constipation but occasionally necessitates the use of minimal quantities of this sugar in very small infants and those that are liable to have loose stools. However, when it is considered that one level tablespoonful, one-third ounce, of wheat germ sugar supplies as much of the antineuritic factor as a whole quart of milk, it may be seen that it is not necessary to give large amounts to infants in whom it proves to be too laxative. In such cases I have combined it with cane sugar, milk sugar, or the various dextrin and maltose sugars. The mixtures that have been fed as a routine have been simple dilutions of whole cow's milk and water, and boiled or dried milk. The quantity of this sugar used in the daily twenty-four hour amount of food varied from one level tablespoonful to four. At first the larger quantities were used but it was soon learned that it was well to begin with one tablespoonful or less and gradually increase the quantity up to the point of the individual infant's tolerance. In some cases more than two tablespoonfuls would cause looseness of the stools, while other infants would regularly take three or four and in some instances five tablespoonfuls daily.

EFFECT OF VITAMIN B THERAPY

In a clinical study of this sort, conclusive proof of the effectiveness of any one food or particular scheme of feeding is not gained by weight charts alone for, after all, those who are experienced in feeding infants

Results in Twenty-One Infants Believed to be Suffering from Vitamin B Deficiency

		When Wheat Germ Sugar Was Started					In One Month					In Two Months					In Five Months				
	Age in	Weight		Ano-	Muscu-		Weight		Ano-	Muscu-		Weight		Ano-	Muscu-		Weight		Ano-	Muscu-	
Case	Mos.	Lb.	Oz.	rexia	lature	Color	Lb.	Oz.	rexia	lature	Color	Lb.	Oz.	rexia	lature	Color	Lb.	Oz.	rexia	lature	Color
1	11½	19	3	+++	Poor	Pale	20	8	0	Improved	Improved	22	0	0	Good	Good	26	4	0	Firm	Good
2	4	8	1	++++	Atrophy	Pale	9	5	0	Improved	Improved	10	13	0	Firm	Good	19	6	0	Firm	Good
3	5	15	8	++	Fair	Good	18	1	0	Good	Good	19	9	0	Firm	Good	24	2	0	Firm	Good
4	4	11	14	+++	Flabby	Good	14	12	0	Improved	Good	18	2	0	Firm	Good	24	4	0	Firm	Good
5	4	15	4	++	Fair	Good	18	0	0	Firm	Good	20	3	0	Firm	Good	23	2	0	Firm	Good
6	5	15	1	+++	Fair	Pale	16	4	0	Improved	Good	18	1	0	Firm	Good	22	5	0	Firm	Good
7	5	14	0	++++	Flabby	Fair	16	12	0	Good	Good	19	2	0	Firm	Good	23	13	0	Firm	Good
8	4½	16	1	++	Good	Good	17	7	0	Firm	Good	19	3	0	Firm	Good	22	6	0	Firm	Good
9	5	18	10	++	Flabby	Pale	20	6	0	Fair	Good	22	1	0	Firm	Good	26	9	0	Firm	Good
10	5	13	0	++	Good	Good	14	15	0	Firm	Good	15	13	0	Firm	Good	19	15	0	Firm	Good
11	3	12	2	+++	Good	Good	14	0	0	Firm	Good	16	3	0	Firm	Good	20	0	0	Firm	Good
12	6	16	8	+++	Fair	Good	18	6	0	Good	Good	19	15	0	Firm	Good	24	3	0	Firm	Good
13	5	17	12	+	Spastic	Pale	19	14	0	Normal	Improved	21	4	0	Normal	Good	24	15	0	Firm	Good
14	6	13	11	++++	Flabby	Pale	15	2	0	Improved	Improved	17	3	0	Firm	Good	23	7	0	Firm	Good
15	5	15	5	++	Fair	Good	16	14	0	Good	Good	17	13	0	Firm	Good	19	3	0	Firm	Good
16	5	15	2	+++	Good	Pale	16	4	0	Good	Improved	17	5	0	Firm	Good	22	4	0	Firm	Good
17	5	16	0	+++	Good	Good	16	6	0	Good	Good	18	4	0	Firm	Good	21	9	0	Firm	Good
18	5	11	12	++++	Fair	Good	13	10	0	Good	Good	15	11	0	Firm	Good	23	8	0	Firm	Good
19	3½	7	7	++	Poor	Pale	9	3	0	Fair	Improved	11	0	0	Firm	Good	17	9	0	Firm	Good
20	4	14	11	+++	Fair	Pale	16	12	0	Improved	Improved	17	13	0	Firm	Good	21	7	0	Firm	Good
21	5	14	4	+	Good	Good	15	13	0	Good	Good	18	0	0	Firm	Good	23	4	0	Firm	Good

make them gain by one means or another so that the aggregate is bound to be good. All the babies gained extremely well unless there was some congenital inferiority or organic disturbance, or complicating chronic or acute infection, in which case they were excluded from the series. In this series of cases the effect of vitamin B therapy has been studied with two objectives in mind: first, as a prophylactic, and, second, as a curative agent in infants who have already developed such symptoms as loss of appetite, failure to gain in weight, listlessness and flabbiness, or who have a general appearance of ill being without any organic illness to account for it, and in some cases which Hoobler calls incipient beriberi, the symptoms of which have been stated. Unfortunately, there is no yardstick by which to measure in children the value of vitamin B therapy as there is with vitamin D, in which roentgenograms of the bones and chemical analyses of the blood (calcium and phosphorus) are a definite measure of its efficiency.

The first group of 129 infants, the prophylactic group, fed with simple milk and water feedings in which wheat germ sugar was used as a routine all showed a surprising freedom from anorexia, and none

6. Sherman, H. C.: Chemistry of Food and Nutrition, ed. 3, New York, the Macmillan Company, 1927, p. 408.

of them went through the period which has been described as the vitamin B deficiency period. They gained continuously in weight, were weaned successfully, and were given vegetables at the age of 9 or 10 months, when in some instances the sugar was discontinued. Of these babies some were well at the start, others presented the usual feeding problems of malnutrition and the various gastro-intestinal disturbances, and all were given wheat germ sugar early and throughout the bottle period; and it can only be said of them as a group that they did exceedingly well. The average age at which the sugar was started was 2 months and the average age at which it was discontinued was 9 months. The average gain in weight during the five month period was 12 pounds 3 ounces (5.5 Kg.).

The accompanying table shows the results obtained in the second group of twenty-one infants. Most of them were of average weight for their age and some of them were even above the average when the wheat germ sugar was started, but there had been a period of from two to five weeks previously when the weight had fallen off or there had been a cessation of gain in weight and they had become fretful, many of them were pale and flabby, and all had a marked degree of anorexia. The plus marks in the first anorexia column indicate the degree of anorexia, one plus indicating that an ounce of two of the food was left in most or all of the feedings; two plus, some food was left in every feeding; three plus, at least a third of the food was left, and four plus, one half or more of the food could not be given in spite of considerable urging. On the administration of wheat germ sugar the improvement was not always immediate; sometimes two weeks would elapse before the appetite would return, but when the anorexia had disappeared a prompt increase in weight took place. Another noticeable feature of the table is the weight of most of the infants after they had been fed with the wheat germ sugar for five months; infant 4, for instance, weighed 24 pounds 4 ounces (11 Kg.) at 9 months of age. It would seem that the average weight of these infants at the end of the five months period was much above that of any other group that one might take from one's files at random. It may be possible that these cases did not represent the average group of infants because, if any acute illness, infection or other untoward event took place to interrupt the infant's progress, such an infant was excluded from the group.

CONCLUSIONS

1. I concur in the opinion of Macy and Hoobler that cow's milk, and in some instances breast milk, does not contain the optimal quantity of vitamin B.

2. Some vitamin B factor besides that contained in cow's milk should be added as a routine to the food of all bottle fed babies, just as cod liver oil and orange juice are universally used.

3. One-third ounce by weight, or one level tablespoonful of wheat germ sugar, provides as much of the antineuritic factor as one quart of milk, and as much of the pellagra-preventing factor as ten ounces of milk.

4. This sugar is more conveniently used, more palatable, and more easily available than yeast.

5. I am of the opinion that from one to three tablespoonfuls (from one-third to one ounce by weight) should be given daily to every bottle fed baby throughout the first year of life.

125 East Thirty-Ninth Street.

SODOKU TREATMENT IN PARESIS

PRELIMINARY REPORT ON SEVENTY-TWO CASES

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The first use of *Spirochaeta morsus-muris*, the rat bite fever organism, in the treatment of paresis in this country was made by Dr. H. C. Solomon [1] of Boston. With this treatment he hoped to eliminate most of the disadvantages of the malaria treatment. He found the treatment comparatively simple and harmless; the infection was of a benign character and easily controlled by arsphenamine. In addition, rat bite fever was less severe on the patient than malaria and could be used on patients who were immune to the latter. We found that rat bite fever could not be transmitted from man to man. The spirillum of rat bite fever lives in the blood of rats and mice without producing symptoms of illness. Guinea-pigs infected with *Spirochaeta morsus-muris* show symptoms similar to those in man.

The encouraging report on this method by Solomon and his co-workers stimulated us to try this form of treatment in some of the paretic patients in a few of the Illinois state hospitals. Any therapeutic measure that promises a modicum of help for the doomed paretic patient is worth a trial. The patients in this series were selected at random.

METHOD OF TREATMENT

Inoculation.—Seventy-two patients from three hospitals were inoculated with the rat bite fever organism. In the Chicago State Hospital thirteen women and fourteen men were inoculated; in the Elgin State Hospital, fifteen men and thirteen women, and in the Kankakee State Hospital, eleven women and six men. These patients were inoculated about the same time with *Spirochaeta morsus-muris* in the latter part of August, 1927. All of the cases had been classified as paresis with the exception of two or three, which had been diagnosed as taboparesis. All of the patients were inoculated with the blood of an infected guinea-pig. In some previous inoculations the blood of an infected rat had been used but no reaction was obtained. Two-tenths cubic centimeter of blood drawn directly from the heart of the guinea-pig was injected subcutaneously in the upper and inner aspect of the left thigh.

General Care.—All patients were put to bed and remained there until complete recovery had taken place. Temperature, pulse and respiration were recorded every four hours unless the temperature exceeded 101.6 F.; then it was taken every two hours until it came down to this level. Temperatures were not taken at night. The diet was a general one. Therapeutic measures were generally hygienic, and symptomatic treatment was instituted occasionally when absolutely needed. A

1. Solomon, H. C.; Berk, Arthur; Theiler, M., and Clay, C. L.: The Use of Sodoku in the Treatment of General Paralysis, Arch. Int. Med. **38**: 391-404 (Sept.) 1926.

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temperature of 101.6 is sometimes seen in paretic patients and therefore this temperature was attributed to the paresis unless accompanied by other signs and symptoms of sodoku, such as neuralgia, muscular pains and general malaise.

Course of Disease.—The inoculation period varied from eight to fifteen days. In the greater number of patients a slight induration about the size of a walnut appeared at the site of inoculation. It was slightly tender, seldom discolored, and had a tendency to disappear for a few days. From the tenth to the fifteenth day after inoculation the induration changed to active inflammation, impairing the movements of the muscles of the left lower extremity. A few days later about 45 per cent of the patients developed a blister in the center of the inflamed area. This blister ruptured or sometimes it dried up entirely after a few days. In other patients a blister did not form, but the center of the indurated area became necrotic and was surrounded by very tender and highly inflamed tissue involving an area from 4 to 6 inches (10 to 15 cm.) in diameter. The large ulcer formed had a punched-out appearance, was from 1 to 4 inches (2.5 to 10 cm.) in diameter, and was generally oval. Solomon now advises intramuscular inoculation to obviate ulceration.

Within a week after the inoculation the inguinal lymph glands on the same side became enlarged but without tendency to inflammation or induration. This enlargement persisted throughout the course of the disease. With the local reaction, severe muscular and neuralgic pains involving the extremities and the back and sometimes the entire body were quite common.

The fever became pronounced within ten to fifteen days after the inoculation but without chills. The paroxysm continued from three to four days, the temperature reaching a height varying from 102 to 105 F. and lasting four or five days. The second paroxysm usually appeared about the nineteenth day and in most cases lasted two days; the third paroxysm and the one following appeared after three to four days of remission. The later paroxysms were shorter in duration, with a progressively lower maximum in temperature. The highest temperature in any of the cases was 106.

Pulse and Respiration.—These were usually in proportion to the fever, unless the drop of temperature was sudden. In such cases there was a temporary increase in the pulse rate.

Secondary Manifestations.—Skin eruptions were present in about 25 per cent of the patients in this series. Usually at the end of the second week after inoculation an erythema appeared, involving the upper part of the body and the upper extremities. A few patients developed papules of a bronze color. One showed a herpes formation and another an edema of the feet. One patient had a skin eruption one week after inoculation, which disappeared suddenly but reappeared four weeks afterward. This again disappeared quickly. Each eruption was accompanied by malaise. Enlargement of the inguinal lymph glands appeared in 75 per cent of the patients; distant lymph nodes were involved in about 15 per cent. A few showed an enlargement and hardening of the epitrochlear lymph nodes similar to that found in active syphilis.

Laboratory Observations.—A polymorphonuclear leukocytosis corresponding to the degree of infection was present in all patients. A moderate anemia was noted in practically all those treated by this method. The coagulation time of the blood was not affected. The spinal fluid blood Wassermann and Lange tests did not show much change, but a few negative spinal fluid reactions were noted.

Complications.—Beginning as early as the thirty-second day after inoculation and about ten days after the administration of neoarsphenamine, and as late as 100 days after the first inoculation, complications appeared in some cases. Eighteen patients developed joint symptoms in the form of swelling, redness and pain. In some the larger and then the smaller joints were involved. One patient had the following sequence of arthritides: left elbow, right elbow, junction of zygoma and maxillary bones. The elbow joint and the ankle were the most commonly involved. Two patients developed delirium and convulsions; two suffered from disorders of the heart and dyspnea. Eight patients had a very marked muscular involvement consisting of swelling, redness and severe pain. One lost control over the organic reflexes during the course of the disease. All complications yielded to one or two administrations of neoarsphenamine. More than half the patients in this series suffered from severe neuralgia at some stage of the induced infection.

Termination of Infection.—The paroxysms of fever were allowed to continue for an average of thirty-two days; then 0.3 Gm. of neoarsphenamine was administered intravenously. This was sufficient to control the disease in more than 50 per cent of these patients. The remainder developed complications and again had fever, which yielded to the second dose of neoarsphenamine. Only a few patients required a third administration. Nine patients recovered spontaneously from the infection but were given one dose of neoarsphenamine.

Deaths.—Ten patients died during the treatment, two from pneumonia, one from myocarditis, one in an accident, and four from paresis (these patients had been in poor condition before inoculation and did not show any reaction to the infection). Only two deaths could be directly attributed to the rat bite fever infection.

RESULTS

After one year of observation we noted the following approximate percentages of improvement: Fifty per cent of the patients were more or less physically improved; 20 per cent showed from slight to marked mental improvement; 60 per cent did not show any difference mentally; 10 per cent at first showed improvement mentally and then became worse.

From our observations it is quite evident that the height of fever did not have any bearing on the degree of improvement. In fact, many patients with a moderate fever curve showed better mental improvement than those with excessive temperatures. The physical improvement occurred at the earliest time and was most pronounced; many patients gained more in weight after the treatment than they had weighed for many years previous. Neurologic improvement could not be definitely demonstrated. Mental improvement occurred later than physical improvement.

Attributes of a Physician.—The physician should be a leader in his community. To be the right kind of a leader it is essential that he should be an educated man. Modern medical education cannot be imparted to every one; it can be imparted to the best advantage only to persons of good character, fixed purpose, good native intelligence, trained to serious application. The maturity, previous training and intellectual competence of the student body determine in advance in large measure the scope, quality, method, aims and outcome of the instruction given by the faculty.—Graves, Stuart: Relation of Medical Education to the Public, *South. M. J.*, January, 1929.

PREVENTIVE MEDICINE AS APPLIED TO TUBERCULOUS PATIENTS

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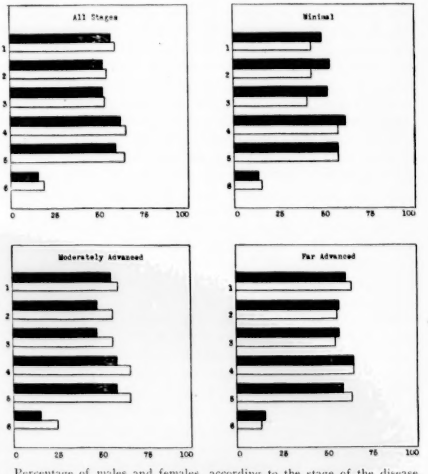
"Every one loves to give advice" is considered an axiom. Yet the National Tuberculosis Association has learned that in at least one-fourth this "axiom" must sink to the level of a superstition. Physicians who are called on by tuberculous patients for medical advice are by no means unanimous in imparting as much as might be expected.

The association has procured histories of 1,499 white patients prior to their first admission to a sanatorium. All were at least 15 years of age and all were diagnosed as having pulmonary tuberculosis at the time they entered. The histories, taken by physicians associated with the institutions, were obtained in considerable detail. They cover the symptoms of the illness; the reason for the first consultation of a physician; the various kinds of physicians (general practitioner, tuberculosis specialist, throat specialist, tuberculosis clinic) consulted by each patient, with the extent of the examination given and the resulting diagnosis; the length of time elapsing between the appearance of the first symptom and the first consultation; the first consultation and the diagnosis; the effort to obtain admission to the sanatorium and the actual admission; the number of nursing visits, and numerous other items. In addition to questions regarding matters of direct concern to the patient, a few were asked which had a bearing on the welfare of those with whom the patient had come in contact.

Tuberculosis is a communicable disease. Since 1882, when Koch discovered the tubercle bacillus, there has been no question about that. It is well known that the germs usually are transmitted from one person to another in the tiny droplets of sputum which accompany the cough or the sneeze of the diseased individual and which are breathed in or perhaps swallowed by those in close association with him. It follows that the best way to reduce the incidence of the disease is to prevent the bacillus from reaching a second host. Four questions directly relating to the spread of infection were asked each patient in order to learn something of the extent to which members of the medical profession are practicing preventive medicine so far as tuberculosis is concerned. These questions, to be answered for each physician consulted, were: Did physician instruct patient as to disposal of sputum? Use of separate dishes? Washing dishes separately? Sleeping alone? The answers were tabulated to show not how many physicians gave such instruction but instead how many of the patients received it.

It was illuminating to find that, though 1,496 of these 1,499 patients had consulted anywhere from one to fourteen physicians each, 625, or 42 per cent, had never been told by any physician how to dispose of the sputum. Of course, some patients did not expectorate; an exceedingly small number were physicians or nurses and were supposed to know what precautionary measures to take, and a few were admitted to the sanatorium almost immediately after diagnosis; but it is difficult to assign any cause other than forgetfulness on the part of the medical adviser to much of the failure to give this instruction, a part of the elementary procedure in the proper conduct of any case of pulmonary tuberculosis. Of the 871 patients given this instruction, 677 first received it from the physician who first told the patient that his illness was tuberculosis; 107 from the physician immediately following the first, and twenty-four others by physicians still further removed from the one first telling the diagnosis to the patient.

A still smaller number of patients were told by any physician that they should keep their dishes apart from those used by other members of their households and that their dishes should be washed separately. Approximately 47 per cent of the patients failed to receive instruction regarding these matters prior to their admission to the sanatorium. In the accompanying chart the representation of these two items is so nearly identical that it is evident that with few exceptions the physician who gave instructions as to the use of separate dishes likewise instructed that these should be washed by the patients themselves, and vice versa.



Percentage of males and females, according to the stage of the disease, who had received instructions prior to admission: black rectangles, males; white rectangles, females. These data are based on the patients' answers to the questions: 1. Did physician instruct patient as to disposal of sputum? 2. Use of separate dishes? 3. Washing dishes separately? 4. Sleeping alone? 5. Other sleeping arrangements? 6. Were any printed instructions given to patient?

The advice to sleep alone was given to 63 per cent of all patients by some physician, more receiving instruction on this particular point than on any other preventive measure. However, only 61 per cent were advised as to other sleeping arrangements. The question as to other sleeping arrangements comes under the heading of cure rather than prevention, but the answers to it have a bearing on the answers to the question of sleeping alone. Taken together, they indicate that the thought of preventing infection was not always in the physician's mind when he advised his patient to sleep by himself, for 11 per cent of the 945 patients who were told to sleep alone and 12 per cent of the 919 given advice as to other sleeping arrangements were so instructed by a physician seen prior to the one who told the patient that he had tuberculosis. Except as an aid to cure, the early instruction as to sleeping seems unexplainable, especially in view of the

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fact that the corresponding percentages for those instructed regarding disposal of sputum, use of separate dishes and washing dishes separately were six, seven and seven, respectively.

For instruction in preventive measures prior to telling the patient that he had tuberculosis, two reasons seem apparent from the histories. Certain physicians have had the welfare of others sufficiently in mind to tell their patients to exercise sanitary precautions, even though a diagnosis of tuberculosis was not yet established. Others, and probably the larger number, have feared to acquaint the patient with the truth, yet have felt impelled to impart a certain amount of public health information.

There was little difference between the sexes as to the percentage receiving instruction on each point, though such difference as existed was in favor of the women.

A fact which calls for comment is that proportionately fewer patients who were able to have care in a private sanatorium had received instruction from their physicians prior to admission than had those admitted to public sanatoriums. This was the case with respect to each one of the items noted.

When the group was considered as a whole, it was evident that, the further advanced the disease at the time of the patient's first admission to a sanatorium, the more apt he was to have received instruction previously respecting the several preventive measures. But, except in regard to sputum disposal, no such correlation existed in the case of the men or the women when considered alone.

Education is the most effective public health measure known for the prevention of tuberculosis with the possible exception of isolation. It also is a potent agent of cure. Oral instruction alone is often relied on to accomplish the education, but oral instruction alone of the tuberculous patient is no more sufficient than oral instruction of a school child. The spoken word needs to be supplemented by the written. The majority of sanatoriums understand this and provide the patient with a booklet containing in a form for ready reference advice that a patient should have. If printed instructions are needed in sanatoriums in which patients are in a position to receive advice continually direct from the attending physicians, they are needed much more by the tuberculous patient at home who may never be able to obtain sanatorium treatment or may obtain it only after a considerable delay. Some physicians realize this and give to the new tuberculous patient in printed form the basic rules to guide him in keeping from procedures harmful to himself and in protecting those with whom he may come in contact.

Each of the 1,499 patients from whom histories were obtained in this study was asked whether printed instructions had been given him by any physician consulted. No attempt was made to go into the detail of such instructions. Seventeen per cent replied in the affirmative, the women to an extent between one-fourth and one-fifth greater than the men, and the women with moderately advanced tuberculosis to a much greater extent than any of the others. The best record on this score was shown by a group of patients reported on by one county sanatorium, 45 per cent of whom had received printed instructions from some physician prior to their admission.

The histories in this group reveal that instruction of tuberculous patients by their physicians in precautionary measures is not especially related either to the stage of the disease on admission or to the sex of the patient. Rather, the proportion of patients instructed varies with the communities served by the sanatoriums and the extent to which their interest in preventive medicine has been aroused. The items of instruction noted in the histories were used merely as an index of the extent to which education regarding public health measures is being given to patients and are by no means all-inclusive. Even patients who received advice on all these points may have failed to receive it on others of importance. By far, too large a number of physicians gave none of the instructions asked about. Some who did stressed one point to the exclusion of others, some another. In view of the fact that the average physician sees only a few cases of active tuberculosis in the course of a year, he cannot be expected always to be a perfect instrument for the dissemination of advice to the patient; but this study would indicate that in the medical profession as a whole insufficient thought is being given to preventive medicine. One fact is evident: The saturation point has not yet been reached in the need for stressing prevention.

VARICOSE VEINS AND THEIR SEQUELAE *

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The leading symptom in varicose veins is the increase in venous pressure. This first actually arterializes the vein, which responds to the pressure with a hypertrophy of all its layers and then dilates it, whereby the muscular coat disappears almost entirely. Further inflammatory changes, insufficient valves and poorly nourished tissues represent only morphologic end-stages of increase in pressure (table 1) and carbon dioxide retention (table 2). A detailed publication of such studies will be made elsewhere.[1]

This study is based on 160 cases of varicose veins and ulcers seen at the varicose vein clinic of Northwestern University. With exceptions to be stated, the patients were treated as ambulant and did not have to stop working.

DIAGNOSIS

In diagnosing varicose veins and their complications, the circulation of the affected extremity must be tested. The pulsation of the femoral, popliteal, posterior tibial, and dorsalis pedis is worth investigating, particularly in older persons.

W. S., a man, aged 60, had had intermittent claudication for more than a year. He was a heavy smoker. After a slight trauma on the right shin, an ulcer had developed, gangrenous in character and progressive. He had a few dilated veins at the inner surface of the calf. Several physicians had seen him and diagnosed the condition as varicose ulcer. When seen, the patient had no pulse in the popliteal, posterior tibial, and dorsalis pedis afteries. At amputation above the knee, an occluding thrombus was found in the popliteal artery. All vessels showed thick atheromatous patches.

The factor of impaired arterial circulation must, then, be borne in mind in true varicose ulcers. A large

* From the Department of Surgery, Northwestern University Medical School.

* Because of lack of space, part of the text and a number of illustrations had to be omitted.

* Read before the Section on Surgery, General and Abdominal, at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 15, 1928.

1. De Takáts, Géza; Quint, H., and Tillotson, H.: The Impairment of Circulation in the Varicose Vein, to be published.

proportion of our patients had hypertension, and that their sclerotic arteries may add to the delay in healing is very probable.

The state of venous circulation is tested by Trendelenburg's method. The patient's leg is well elevated, after which the varices empty. Next, the origin of the great saphenous vein below Poupart's ligament is compressed and the patient is asked to stand up. If the veins remain empty but fill up with a gush of blood from above when the compression is relieved, the test

TABLE 1.—*Effect of Various Measures on Venous Pressure of a Varicose Vein; Trendelenburg Test Positive*

Position of Leg	Pressure in Centimeters of Water	Percentage Decrease in Pressure as Compared to the Standing Position
Standing *	108	0
Standing with paste-boot	75	21
Standing with rubber stocking	88	20
Standing after saphenous ligation †.	43	61
Two weeks later	93	15
Sitting ‡	69	36
Horizontal	19	83
Leg elevated 45 degrees	— 9	108

* The entire weight was put on the extremity.
† Ligation was made just above the inner femoral condyle.
‡ The feet were on the ground.

is positive for valvular incompetence of the great saphenous vein. If the veins fill up suddenly on standing, although the compression is still maintained, the anastomoses with the deep veins must be incompetent. If now the compression is relieved and the veins become still more prominent, the test is doubly positive for incompetence of both saphenous and anastomotic valves. Finally, if after compression the veins fill up slowly from below and do not dilate more after the

TABLE 2.—*Carbon Dioxide Content of Cubital and Saphenous Vein Expressed in Percentage by Volume*

Case	Carbon Dioxide in Cubital Vein	Carbon Dioxide in Varicose Vein	Comment
1	55.8	57.1	
2	46.6	49.4	
3	54.0	59.2	
4	59.1	64.0	
5	56.7	59.1	High pressure in the vein.
6	51.8	52.4	Poor arterial circulation
7	52.7	57.6	
8	53.0	58.9	
9	55.8	60.8	
10	55.8	58.7	High venous pressure
11	54.8	57.8	
12	54.8	58.7	
13	52.8	57.6	
14	53.2	58.1	Varicose veins; edema
15	53.2	59.2	
16	55.1	58.9	
Average, 16 cases	54.0	57.9	

pressure is relieved, the test is negative and the valves are competent.

Even more important is the test for patency and sucking action of the deep veins. If the patient stands up, his superficial veins visibly dilate. Next, a moderate amount of pressure (from 30 to 50 mm. of mercury) is thrown into a blood pressure cuff applied around the thigh. The pressure must only obliterate the superficial veins. The patient is now asked to walk to and fro in the room, during which time the varices diminish in size. When the pressure cuff is suddenly deflated, the veins fill up from above. This test, first described by Perthes, demonstrates a flow from the superficial into the deep veins, into which the blood is sucked by muscular action.

Yet too much significance must not be attached to this sign. If the patient is up and around with marked superficial varicosities and hardly any swelling of the ankle, or none at all, is present, then the deep circulation is sufficient. The circulation in the superficial dilated system is reversed and out of commission anyway. If the deep veins are thrombosed and the superficial veins undergo a compensatory dilatation, they should not be attacked.

TYPES OF VARICOSE VEINS

For purposes of discussion the classification of varicose veins as given by Virchow and modified by Berntsen [2] is most serviceable. Type 1 is the isolated, saccular varix, usually appearing along the course of the great saphenous vein. Type 2 is the fully developed, tortuous, cavernous mass of varices, either in the great or in the small saphenous vein. Type 3 is the uniform dilatation of a larger trunk. Such veins have markedly hypertrophic walls and undergo a dilatation with persisting increase in pressure. Type 4 consists of fine cutaneous dilatations, usually in the external surface of the thigh of stellate design.

The first three types are naturally just transient forms of the same progressing disease but are helpful in establishing the indications for various forms of treatment.

Complications of varicose veins are the ulcers, the superficial phlebitis, and the various manifestations of impaired nutrition of the skin, in the form of eczema and hyperkeratosis, and of the bones, as periostitis. They have no connection whatever with the deep thrombophlebitis occurring after childbirth, pelvic operations or typhoid. The deep thrombophlebitis may also lead to ulcers, and the differentiation between varicose ulcers and thrombophlebitic ulcers is important.

Varicose ulcers occur in the presence of preexisting varicose veins after slight injury, possibly superimposed infection. The wound does not heal because of poor nutrition, becomes chronic, and may occasionally flare up and start a phlebitis of the superficial veins. Its most common site is a few finger breadths above the inner or outer ankle, where it is very resistant to treatment.

The thrombophlebitic ulcer occurs in persons who do not have varicose veins but who, after a trauma or a pelvic infection, develop a thrombophlebitis of the deep veins. If the edematous, glossy skin breaks down, its appearance differs from that of the varicose ulcer. Multiple flat ulcers, with a livid undermined epithelial margin and a history of thrombophlebitis preceding the ulceration, are of help in the diagnosis.

The skin manifestations seen in patients with varicose veins are the consequence of venous stagnation. All variations from an atrophic scaly skin to a hyperkeratosis and nodular and papular eczema are seen. Quite often the periosteum of the tibia, and more rarely that of the fibula, is thickened. Not only is this true at the site of chronic ulcers, but it may be present without any ulceration and may be confused with a syphilitic periostitis or a chronic osteomyelitis with thickened circumferential lamellae.

In one case a surgeon drilled through a chronic varicose ulcer into a normal bone marrow, because of the marked periostitis seen in the x-ray film, which he interpreted as osteomyelitis. The bone marrow subsequently became infected and the tibia had to be widely exposed and saucerized.

2. Berntsen, Aage: Des varices du membre inférieur, spécialement au point de vue de l'étiologie et du traitement chirurgical, Acta chir. Scandinav. **62**: 61-85, 1927.

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SELECTION OF CASES

One hundred and sixty patients whose treatment has been completed were selected for study (table 3.) [2a]

The average age of patients with varicose veins was 37 years. Their age at the onset of first symptoms was 24. In the group of varicose ulcers, the average age was 52, while the onset of first symptoms of varicose veins was given as 33. While very little significance can be attributed to statistics studying the age of patients when first seen, much more important is the fact that varicose veins give their first symptoms in the twenties. Seventy-five per cent of all patients, including those with varicose veins and ulcers, had symptoms that they could remember below the age of 30. This fact illustrates well the progressing tendency of the disease and corresponds very well with the statistical figures of Berntsen.[2]

TABLE 3.—*Varicose Vein Clinic—Management and Results*

Diagnosis	Number of Cases	Type of Treatment*	Cured †	Improved	Unimproved	Stayed Away
Varicose veins:						
Type 1.	25	Injections (5)	24	1	..	..
Type 1, 3.	31	Ligation plus (7) injections	27	4	..	..
Type 2.	32	Radical excision;	10	..	..	..
		ligation plus injections	2	..	..	20
Varicose ulcer:	41	Injections (15); paste-boot (12)	30	3	..	8
Traumatic ulcer:	4	Paste-boot (4)	4	..	..	..
Arteriosclerotic gangrene:	1	Amputation	1	..	..	..
Trophic ulcer:	1	Periarterial sympathectomy	..	..	1	..
Syphilitic ulcer	1	Antisyphilitic treatment				
Acute phlebitis	10	Rest in bed; paste-boot; ligation (2)	8	2	..	..
Thrombophlebitic ulcer:	2	Paste-boot	..	2	..	..
Deep phlebitis:	12	Paste-boots; physical therapy	2	9	1	..
Total.....	160		111	21	2	28

* Numbers in parentheses indicate the average number of treatments in that group.
† Cured means immediate relief; no late results have yet been estimated.

As to sex incidence, in this clinic 59 per cent were females and 41 per cent males. While the dominance of women may be due to the influence of pregnancies, it must be remembered that we saw a group of beginning varicosities in women at a stage when men would not seek medical advice.

MANAGEMENT OF CASES

Supporting Measures.—Support to the varicose extremity is a time-honored method. Our pressure readings (table 1) would indicate that a definite decrease in venous pressure can be accomplished by the use of the elastic bandage and even more with the jelly bandage. I have used an elastic bandage in patients undergoing the injection treatment or following operation. Extensive use has been made of Unna's zinc-gelatin-glycerin paste in the treatment of ulcers and of thrombophlebitis. After several modifications of the original formula, the following gave the most satisfaction: zinc oxide, 100 Gm.; gelatin, 200 Gm.; water, 300 cc.; glycerin, 400 cc.

The preparation of this paste requires some experience on the part of the druggist.[3] Two pounds of this material is enough for five patients, and the material can be cut up into five equal slices, warmed in a water bath and painted with a broad brush on the unshaven leg of the patient. The ulcer can be painted with this paste without any protecting gauze. After a uniform layer of the paste has been spread on the leg, a 3 inch gauze bandage is applied but must never be reversed. No folds are permissible. After another layer of paste, another layer of gauze bandage is applied and these two layer bandages should suffice in most cases, when the bandage is renewed every week. In case of deep thrombophlebitis, when the bandage can be left on from three to four weeks, three or four layers of paste and bandage should be applied. The bandage here can be advantageously replaced by white cotton stocking. I do not believe in painting the final layer of paste with formaldehyde-alcohol, as advocated by some, because that removes some of the elasticity of the bandage and makes it stiff and brittle.

This paste-boot is applied to every leg ulcer, whether varicose, syphilitic, thrombophlebitic or traumatic, and forms the basis of all ambulatory treatment. Through its meshes it allows of a free perspiration of the skin and permits the patient to go about his work painlessly, decreasing the venous pressure, treating the eczematous skin, and improving the deep venous and arterial circulation. It is not regarded, however, as a permanent cure for any condition, and offers only temporary support.

The Injection Treatment.—The idea of injecting irritant substances into the vein for purposes of obliteration appears frequently in the French literature of the last century. The injections were made with strong caustic and toxic substances, so that the French Surgical Congress held at Lyons in 1894 officially condemned their use.[4] A step was made forward when instead of toxic and coagulant substances, such as phenol (carbolic acid), tincture of iodine and ferric chloride, hypertonic solutions, causing irritation of the intima, were introduced. Linser, first using 1 per cent mercuric chloride, started the use of 20 per cent sodium chloride solution and reported more than 6,000 injections. The French school under the leadership of Sicard [4] has been using sodium salicylate in 20 to 40 per cent solutions. Nobl [5] has made injections of 50 per cent dextrose in as many as 3,000 patients, and has been recently using calorose, a mixture containing equal parts of dextrose and levulose with 4 per cent sucrose. Meisen [6] uses equal parts of 25 per cent sodium salicylate and 10 per cent sodium chloride. While no attempt is made to cover the literature on this subject, it may be mentioned that sodium citrate, quinine and urea have been advocated, but none of these drugs seem to have attracted wide attention.

In this country McPheeters [7] has reported very favorable results with sodium salicylate. Cannon and Loewenfish [8] have used a 36 per cent sodium salicylate solution in the treatment of varicose ulcers.

2a. Since this article was completed, another 150 cases have been treated. Their management and the results obtained conform entirely to the first series.

3. Mix the zinc oxide with enough water to make a thick paste, then add the glycerin gradually while stirring. Soften the gelatin in cold water and squeeze the water out as quickly as possible. The gelatin will still contain about 3 parts of water, which is all that is needed. Heat the gelatin on a water bath and under constant stirring add the zinc oxide-glycerin mixture.

4. Sicard, J. A., and Gaugier, L.: Le traitement des varices par la methode locale sclerosante, Paris, Masson et Cie, 1927.

5. Nobl, G.: Die Calorose als Verodungs mittel varikös entarteter Venen, Wien. klin. Wchnschr. **39:** 1217-1220 (Oct. 14) 1927.

6. Meisen, V.: Injection Treatment of Varicose Veins and Their Sequelae, Acta. chir. Scandinav. **40:** 435-462, 1926; **42:** 17-40, 1927.

7. McPheeters, H. O.: The Injection Treatment of Varicose Veins by the Use of Sclerosing Solutions, Surg. Gynec. Obst. **45:** 541-47 (Oct.) 1927.

8. Cannon, A. B., and Loewenfish, F. P.: Varicose Ulcers of the Leg, Arch. Dermat. & Syph. **15:** 647-651 (June) 1927.

The following method has been gradually evolved in our clinic in the last two years: The patient is examined in the standing position and the most peripheral dilatation is selected for injection. This segment is isolated between the second and third fingers of the left hand and the patient's leg is brought to a horizontal position, the skin rubbed with alcohol, and a fine 24 gage needle on a 10 cc. Luer syringe is inserted

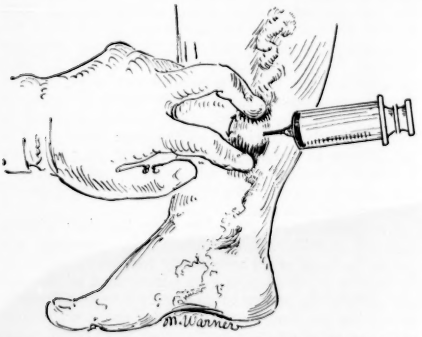

Fig. 1.—Technic of injecting a varicose vein: Second and third fingers of the left hand isolate a segment of the vein. A fine 24 gage needle is inserted and the injection is slowly made after successful aspiration for blood.

into the vein, which is immediately aspirated for blood (fig. 1). Only in case of free flow of blood is the injection permissible. From 5 to 10 cc. of a 50 per cent dextrose solution is injected slowly. The needle is kept in the vein and the compression of the vein above and below is maintained for another two minutes. After the needle has been withdrawn, a cotton plug is pressed against the vein and is kept in place under pressure by strips of adhesive plaster (fig. 2). This should not be removed for at least forty-eight hours following the injection. Usually another injection is given at the same time, from 3 to 4 cm. higher. The injections are repeated biweekly. An elastic bandage is advisable during the entire course of treatment. Massive injections of from 40 to 80 cc. either without [9] or with [10] preliminary ligation of the vein have been avoided.

The effect of such injections has been followed closely. If the vein is excised immediately after the injection, a thrombus does not immediately form, as has been reported by Meisen. The intima is hyperemic, looks swollen, and presents the microscopic appearance of an endophlebitis (fig. 3). According to my experience in more than 1,000 injections, two things can happen. Either the vein remains collapsed, the two injured surfaces of the endothelium being held together by the exudate and the microscopic picture of an obliterating endophlebitis results, or a definite thrombus occurs, which starts to organize rapidly and can be palpated as a firm mass in the vein. In either case the pressure below the vein has been decreased considerably.

A histologic study of such thrombi shows a very active process of organization, fibroblasts and newly formed capillaries entering the thrombus at right angles from the injured intima (figs. 4 and 5). The difference between such a thrombus following a physicochemical injury, and a static intravital thrombus taken from an iliac vein is very striking in that the static thrombus hardly shows any roots of fibroblasts and capillaries emerging from the vessel wall, but simply adheres to the wall by cohesion (fig. 6).

The process of organizaion usually lasts from two to three weeks. Therefore an elastic bandage is particularly important at this period; otherwise the increase in venous pressure may canaliculize the thrombus or the obliterated vein very easily. However, we do insist on having the patients up and do not favor immobilization in bed.

There is no pain during the injection of dextrose. Shortly after the injection, as pointed out by many observers, a tingling or even a cramp ensues in the calf. This cramp may extend toward the ankle or toes or rise along the great saphenous vein. Cramp has been very marked with salicylate injections, less marked with hypertonic salt solution and only infrequently seen after dextrose injections. From my observations, it seems possible that perivenous fibers of the saphenous nerve are irritated by the solution. I have also seen the vein contract after an injection, so that a venous spasm as a cause of pain cannot be excluded.

While an injection beside the vein must be avoided, necrosis does not ensue if some of the dextrose leaks out of the vein or if the needle slips out. Both sodium chloride and sodium salicylate will cause necrosis, and a number of such observations have been made.[11] Sodium chloride then may cause necrosis; its injection is followed by a marked cramp, and its obliterating effect has not been reliable in our hands. Sodium salicylate is a very powerful irritant, causes a marked cramp and has a prompt effect, but seems too caustic. After many trials I have found the 50 per cent solution

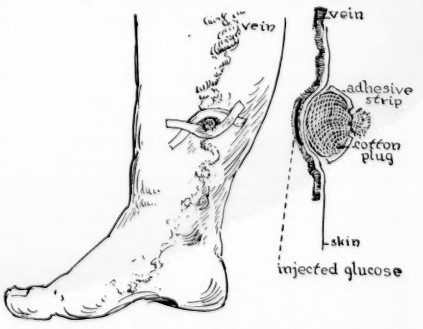

Fig. 2.—The vein is compressed after the injection by a gauze or cotton plug. The compression should be maintained for at least forty-eight hours.

of dextrose the blandest and yet sufficiently efficient material.

Indications for Injection Treatment: Most authors using the injection treatment are not setting any limitations to this method. From my past experience with radical excision of varicose veins and from the results obtained in this series, I have observed the following indications.

9. Valkanyi, R.: Treatment of Varicose Veins and Varicose Ulcers, Orvoskepzes **17**: 528, 1927 (Hungarian).

10. Moszkowicz, L.: Behandlung der Krampfadern mit Zuckerinjektionen kombiniert mit Venenligatur, Zentralbl. f. Chir. **54**: 1732-1736 (July 9) 1927.

11. Meisen (footnote 6). Valkanyi (footnote 9).

In case of isolated saccular varices (type 1), a few injections may abolish all subjective and objective symptoms. If this type is combined with type 3, namely, uniform hypertrophy and dilatation of the saphenous branch, the injection treatment is combined with an ambulatory ligation at the highest palpable point. Type 2 varices, consisting of fully developed, tortuous masses, with varicosities on the thigh and in the popliteal space, and with a positive Trendelenburg sign, are radically excised or stripped with the Babcock instrument. The pressure in such veins is so great, the number of necessary injections so many, and the obliteration so difficult that in such cases radical surgery is still advised. Only if the patients refuse operation or cannot stop working for three weeks do we use the injection treatment.

J. H., a white man, aged 55, a laborer, had had varicose veins for ten years, with a greatly dilated saphenous vein palpable from the middle of the thigh to the level of the knee. Extensive tortuous varicosities were present on the inner and posterior surface of the calf. After ambulatory ligation at the highest palpable point, fifty injections of dextrose were made until all the larger veins became obliterated. The chief difficulty seemed to lie in the fact that the ligation did not relieve the pressure very much and an obliteration could be accomplished only gradually.

The dilated veins seen above varicose ulcers are most amenable to injection treatment. As long as varicose ulcers are treated with paste-boots, the pressure is being relieved temporarily. But the frequent recurrence of such ulcers is only too well known. In our clinic we have combined the use of paste-boots with injections. Eczema and ankle edema are not contraindications to such treatment but, on the contrary, are beneficially influenced. Care must be taken not to inject too close to the ulcer if it is acutely inflamed.

The injection treatment is contraindicated:

1. In acute phlebitis, whether superficial or deep veins are affected.

2. In chronic deep thrombophlebitis when, after a history of a "milk leg" after childbirth, pelvic operation or infectious disease, superficial varicosities appear. An injection may set up a new attack of deep phlebitis.[4]

Fig. 3.—Drawing of a vein excised immediately after injection: There is a small subintimal hemorrhage at the site of inserting the needle. The intima is swollen, hyperemic. No thrombus has formed.

Cardiorenal symptoms, diabetes and age are not contraindications. I have performed injections in a patient with a blood pressure of 220 systolic and 110 diastolic, and have treated six patients with a systolic pressure of more than 180.

My only diabetic patient was treated with sodium chloride injections, in order not to upset his daily carbohydrate intake.

My oldest patient to be treated by injection was 72; the youngest, 18.

It is exactly in such conditions that the injection treatment is particularly of advantage instead of surgery.

Ligation of the Saphenous Vein.—The ligature of the great, or, if involved, of the small saphenous vein has been carried out on ambulant patients under local anesthesia. At the highest palpable point, usually about a hand breadth above the inner femoral condyle, the vein was exposed with a small transverse incision, doubly ligated, and cut. The skin was closed with interrupted dermal sutures.

This operation was performed on patients who had a uniformly dilated straight main trunk and was used in combination with the injection treatment. As it noticeably reduces venous pressure at least for a certain time (table 1), the formation and organization of a thrombus or an obliterative phlebitis were favorably influenced.

If the varicosities are present in the middle and upper third of the thigh, and the veins on the lower leg are

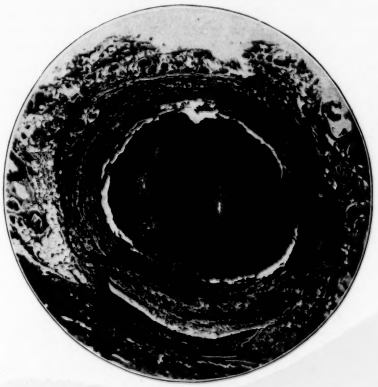

Fig. 4.—Section of a vein, one week after the injection of 50 per cent dextrose solution: Marked dilatation of the vasa vasorum. The intima is destroyed and a large thrombus has formed.

of type 3, the patient is hospitalized and the procedure carried out is high saphenous ligation.

High Saphenous Ligation and Radical Excision: The operation is done under local infiltration anesthesia. The great saphenous vein is tied as close to the saphenofemoral junction as possible. The rationale of this is best illustrated diagrammatically (fig. 7). In case the vein is tied below this anterolateral branch, the latter will dilate, as I had opportunity to observe several times. The vein from the ligation to the height of the medial condyle is now stripped with a Babcock sound, the tip of the sound being carried not below the level of the knee joint. Below the knee, according to the extent of the veins, one or two longitudinal incisions are carried down the leg, and the tortuous masses are removed *en masse*. Lateral ramifications are followed as far as the flaps permit and tied. A compression bandage is applied from the ankle to Poupart's ligament. The patient's leg is not elevated in bed; immobilization is not done but the patient may sit up immediately after the operation, and may be up in a chair the fifth day, and may leave the hospital on the tenth. An elastic bandage must be worn from two to three months after the operation.

The management of varicose ulcers was as follows: If the ulcer was acutely inflamed and the leg was edematous, weekly paste-boots were applied till the acute infection subsided. Then the venous pool on which the ulcer usually sits was occluded with dextrose injections, which were continued as far as the level of the knee joint. No attention was paid to the bacterial flora of the ulcer, as careful studies have shown that no relation of the course and healing tendency to the type of bacterium could be found in the chronic surface

infections.[12] The only medicaments ever used were the ointment of Mikulicz [13] in very atonic granulations, and an 8 per cent scarlet red ointment to stimulate epithelization. In only two cases were Thiersch grafts made, one in a hospitalized patient, which took, another in an ambulant patient in whom the paste-boot was used after the graft. The center of the graft took and served as a nucleus for further epithelization.

After the ulcer healed, the paste-boots were continued at least for another four weeks and visible or palpable veins on the lower leg were obliterated. If there is no edema at that time, elastic bandages are not given.

In the resistant type of ulcer the following causes were found for slow improvement or none at all:

1. There was a diminished arterial flow to the extremity. The histamine response was delayed or negative.[1]

2. The ulcers were situated just above or below the ankle. In spite of carrying the paste-boot down to

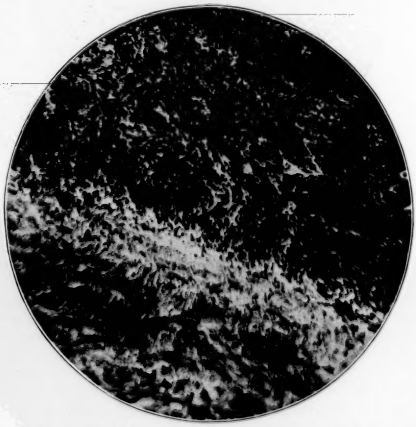

Fig. 5.—Same section as in figure 4 under high power: Note the reaction of the vessel wall and the active proliferation of fibroblasts and capillary buds.

the phalanges, the support to the veins was not adequate. Also the communications with the deep venous system do not possess any valves on the foot [14] and the venous flow cannot be obviated by elastic support or injections.

3. A true elephantiasis may result from the persistent venous and lymphatic obstruction. Vertical suspension for a few days has diminished the edema rapidly. Thiersch grafts took well. The patient was lost sight of before the treatment was completed.

Syphilitic ulcer with a syphilitic phlebitis was seen in one case:

R. L., a colored man, aged 46, had several indurated veins on the inner surface of the right calf and two punched out ulcers, with a grayish necrotic base. There were several strongly pigmented scars of old healed ulcers. Clinically, the ulcer was syphilitic. The Wassermann reaction was 4 plus. Unna's paste-boots, combined with antisyphilitic treatment in the dermatologic department, promptly healed the ulcers. The phlebitic induration diminished under mercury ointment.

ACUTE SUPERFICIAL PHLEBITIS

The usual treatment of acute thrombophlebitis, involving the spahenous veins, consists of immobilizing the patient for from two to three weeks with the limbs elevated. In the light of our clinical studies, this is not necessary and may even be harmful. If the patient has a high temperature and chills, he is put to bed for a few days and dilute alcoholic dressings are applied and covered with perforated oil silk. The application of mild mercurial ointment (33 per cent) over the painful indurated cords seems to favor absorption of the infiltrates. As soon as the temperature and pulse are normal, a paste-boot is applied and compression is exerted with adhesive tape and a cotton plug on the major saphenous vein above the indurated area. These measures relieve the pressure from the inflamed part and decrease the possibility of an ascending thrombosis. If the condition persists, a ligation of the saphenous vein will give decided benefit and shut off the thrombus from further propagation.

DEEP THROMBOPHLEBITIS

I observed twelve cases of deep thrombophlebitis, and although they are apt to be seen in a varicose vein clinic, they have little connection with this condition. The persistent symmetrical swelling after childbirth, pelvic infections and infectious diseases means, of course, an obliteration of the femoral, iliac or cava veins. Compensatory dilatation of the superficial veins in the hypogastrium and pubic region or in the saphenous area should naturally not be excised or obliterated. However, as Homans [14] points out, the persistent edema cannot be simply due to venous obstruction and must mean a lymph stasis. Reichert [15] could show a disappearance of edema in the animal experiment as soon as the lymphatic connection was established in spite of all veins being cut. That the periphlebitic exudate may involve the deep lymphatic channels is quite possible. In obstinate cases a Kondoleon operation might well be considered, as suggested by Homans.[14] In our cases the persistent application of paste-boots and the application of iodine or mercury salves over the edematous extremity to favor absorption have effected slow but favorable results. After the swelling has disappeared, physical therapy may be advised.

THROMBOPHLEBITIC AND TROPHIC ULCERS

As a result of phlebitis the veins become rigid, their valves become insufficient, and the same back pressure results as in varicose veins. The lymph stasis added to the venous stasis makes the healing of such ulcers very difficult. In two cases, after prolonged consistent application of paste-boots, the ulcers healed but a swelling was still present.

Following an injury of the cauda equina, trophic ulcer was seen in one instance. Periarterial sympathectomy gave temporary improvement.

COMMENT

While most of the procedures employed, such as the paste-boot, the ligation of the saphenous vein and the radical operation, are being used everywhere and need

12. Lowenfeld, W.: Zur Bakterienflora des Ulcus Cruris, Wien klin. Wchnschr. **37**: 502-504 (May 15) 1924.
13. Balsam of Peru, 10 parts; silver nitrate, 1; petrolatum, 100.
14. Homans, John: Varicose Veins, Varicose Ulcer, Thrombophlebitis, and Postphlebitic Induration of the Lower Extremities, Nelson's Loose Leaf Surgery, New York, Thomas Nelson & Sons **3**: 729-754, 1927.
15. Reichert, F. L.: The Regeneration of Lymphatics, Arch. Surg. **13**: 871-881 (Dec.) 1926.

but little comment, the injection treatment, with regard to its possible dangers, should be briefly considered. The local complications are, first, the possibility of necrosis if the solution is injected outside the vein, and, second, the flaring up of an old phlebitis as a result of the injection. As to necrosis, I have not seen any in more than 1,000 injections, and it seems that this is chiefly attributable to the use of dextrose, because very experienced clinicians have reported necrosis with sodium chloride and sodium salicylate injections. In two instances a superficial phlebitis developed in a segment of the vein injected. There was no elevation of temperature, but a solid hard cord was palpable above the site of injection. Both patients have had recurrent attacks of phlebitis. The patients were not hospitalized but were treated with paste-boots, and an obliterating plug of cotton at the saphenous vein behind the inner condyle was applied, an excellent form of ambulatory treatment for superficial phlebitis as described by Fischer.[16] Such cases, while infrequent, have impressed me with the importance of preliminary ligations, if the main saphenous trunk was wide open.

The danger of pulmonary embolism originating in the thrombi produced by the injection treatment deserved the utmost consideration. In view of the hopelessness of the present treatment of pulmonary embolism, every thrombus should be regarded with suspicion. However, a definite distinction must be made between small local thrombi, originating in the field of operation or at the site of obliterating injections, and a large static thrombus of the femoral or iliac vein, giving rise to the fatal embolus. The danger of these static thrombi, occurring in the presence of impaired circulation, prolonged immobilization or faulty cramped posture is strongly emphasized by Aschoff.[17] Clinical experience is in full accord with this conception. In massive pulmonary embolism there is hardly ever a sign of phlebitis in the legs. Conversely, in postoperative phlebitis, pulmonary embolism is rare.[18] According to a statistical review from the Mayo Clinic,[19] age, weight, comparatively low blood pressure, and prolonged rest in bed seemed to be important factors. If it is realized that free muscular action and well balanced costal and diaphragmatic respirations are most important in maintaining venous return, then it is easily understood that anterior abdominal incisions and fractures of the femur with progressing age have given the highest percentage of pulmonary embolism in Lister's statistics.[20]

Operations for varicose vein as a rule necessitate a prolonged immobilization in bed; the lower extremities are tightly bandaged from the ankle to Poupart's ligament. To insure a safe organization of the possible thrombus, patients are usually kept in bed from sixteen to twenty-one days. It is to be expected that the incidence of pulmonary embolism after radical varicose vein operations is high. In 16,792 major operations of the second surgical clinic of the University of Budapest[21] there were 405 cases of varicose veins and varicoceles, with a fatal pulmonary embolism of 0.74 per cent. In Berntsen's 376 cases, the incidence of fatal embolism was 0.7 per cent, a remarkable coincidence of these two statistics. The latter also notes 7 per cent of clinically diagnosed emboli, which, however, did not prove to be fatal.

An analysis of fatal pulmonary embolisms reported after injection treatment[22] would indicate that the possibility of such a fatal complication cannot be denied. However, the patient described by Hirsch died four days after a rectal operation, having received injections into the calf several weeks previously. Hohlbaum's patient received 80 cc. of a colloidal iodine solution into the saphenous vein. The leg was splinted, and the patient developed a fatal pulmonary embolus on the fourteenth day. Such a massive injection, followed by an immobilization of the leg, is not comparable to the method used by us. The cases of Lomholt and Olson stand the most severe scrutiny, and should be booked as immediate and seemingly unavoidable consequences of the injection treatment. The patient described by Hammer[23] died of acute mercury poisoning following the injection of mercuric chloride, which illustrated only too well the importance of injecting nontoxic substances.

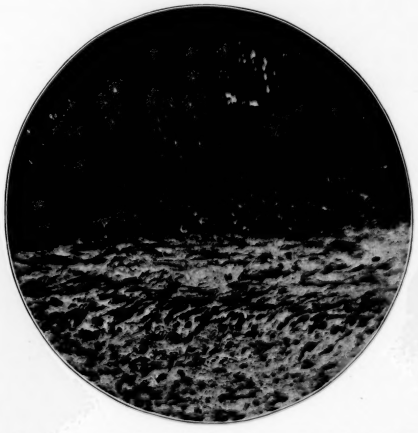

Fig. 6.—Static thrombus in the iliac vein: In spite of the age of the thrombus, as shown by the scarring of the intima, no tendency to organize the thrombus is seen.

It is also possible that infarctions, or nonfatal pulmonary emboli, occur without being recognized. I could find only one such case reported, but here again the patient was immobilized for fifteen days after the injection and showed signs of embolism on the seventeenth day.[24]

Against the two cases of fatal embolism occurring after a correct technic and seemingly unavoidable stand 6,000 injections of Linser, 3,000 injections of Sicard, 3,000 injections of Nobl, 2,000 injections of Meisen,

16. Fischer, H.: Eine neue Therapie der Phlebitis, Med. Klin. **6:** 1172-1173 (July) 1910.
17. Aschoff, L.: Thrombosis, Lectures on Pathology, Paul B. Hoeber, New York, 1924, p. 253.
18. Brown, G. E.: Postoperative Phlebitis: A Clinical Study, Arch. Surg. **15:** 245-253 (Aug.) 1927.
19. Henderson, E. F.: Fatal Pulmonary Embolism: A Statistical Review, Arch. Surg. **15:** 231 (Aug.) 1927.
20. Lister, W. A.: Statistical Investigation into Causation of Pulmonary Embolism Following Operation, Lancet **1:** 111-116 (Jan. 15) 1927.
21. Prochonow, F.: Increase in Postoperative Pulmonary Embolism, Orvoskepzes **17:** 76, 1927 (Hungarian).
22. Hohlbaum, J.: Tödliche Embolie nach Varicen Behandlung mit Pregl-lösung, Zentralbl. f. Chir. **49:** 218, 1927. Hirsch, M.: Ist die kunstliche Thrombosierung varikosentarteter Venen ohne vorherige Ligatur der Vena saphena magna zulassig? Wien. klin. Wchnschr. **39:** 1310 (Nov. 4) 1926. Lomholt, S.: Death from Pulmonary Embolism After Injection of Concentrated Salt Solution in Treatment of Varicose Veins, Ugesk. f. Læger **89:** 7 (Jan. 6) 1927. Olson, O. A.: Fatality Following Varicose Vein Injection, J. A. M. A. **89:** 692 (Aug. 27) 1927.
23. Hammer, F.: Tödliche Quecksilbervergiftung nach antevarikoser Sublimat-injection, Deutsche med. Wchnschr. **45:** 45 (Jan. 9) 1919.
24. Faure, S.: Suite d'une injection sclérosante, Monde méd. **36:** 56, 1926.

and many smaller series in which embolism was not observed. If embolism does not occur after more than 14,000 injections, the possibility of embolism, while undoubtedly present, is minimal. The high incidence of 0.7 per cent embolic deaths after varicose vein operations, the relative frequency of pulmonary infarctions (7 per cent in Berntsen's 376 cases) and the occurrence of postoperative thromboses after these operations put the injection treatment in a favorable light.

Nothing has been said of the end-results here, as the case of longest duration has not been observed even two years. That the end-results of radical excisions are not very satisfactory has been repeatedly shown. The radical methods gave far better results than simple ligations or isolated excisions, but even radical excisions gave only 80 per cent improvement, which after five years deteriorated to 73 per cent. As to other complications, such as phlebitis and ulcer, they had recurred in high percentages after five years.

It is to be expected that recurrences will also be seen after the injection treatment, but in that treatment the initial risk and loss of time were small and the injections can easily be repeated.

Fig. 7.—The internal saphenous vein forms a closed loop on the thigh. (After Delbet.)

SUMMARY

Functional changes, such as pressure disturbances and increase in carbon dioxide content, precede the morphologic changes in varicose veins.

One hundred and sixty cases of varicose veins and their sequelae were studied as to age and sex incidence. More than 1,000 injections with 50 per cent dextrose were made. An individualizing management, of supportive, injection and surgical treatment or their combination, was adopted.

The histologic reaction of the vein following injection has been studied.

Immediate results of the various forms of treatment are tabulated. The possibility of pulmonary embolism following injection treatment and surgical treatment has to be considered. The end-results of surgical and injection treatment can be estimated only after five years. Recurrences are known to occur after radical excisions and may be expected following the injection treatment.

ABSTRACT OF DISCUSSION

DR. H. O. MCPHEETERS, Minneapolis: Dr. De Takáts' work and results agree with those of the best men throughout Europe, where this work began. I do not, however, agree that his groups 1 and 2 should be treated surgically. I believe that we get better and more permanent results with the injection of the saphenous vein high in the thigh than is obtained with ligations. When one does a ligation there is still the chance of an embolus from the proximal end of the vein. This occurred with fatal results in one case in which resection was done of thrombosed knot following the injection treatment. I no longer hesitate to inject the vein in the upper thigh but feel safer if I do so. It is a simple bit of technic to reinject, using the stronger solution, if there should be a recurrence, as compared with another trip to the hospital for operation. I prefer the tight elastic bandage for the extensive cases of acute cellulitis which we see at times in preference to the Unna cast, since I can reapply the bandage more snugly every two or three days as the inflammation and edema subside. We no longer put these patients to bed, since they respond more quickly to ambulatory care if the limb is firmly bandaged. The acute phlebitis is best treated with hot wet packs and elevation. Complete excision of the thrombophlebitis may be all right but again it is radical and usually is unnecessary. At times incision and drainage of the thrombosed loops gives quick results following the use of the hot packs. Of course no injection should be made while the acute phlebitis is present. This is very important. Dr. de Takáts is absolutely right in regard to the care of the ulcerations. I believe that the cure is more rapid if the injections are combined with the supportive treatment. Here again better results are obtained from the elastic bandage combined with the use of a good grade rubber bath sponge over the ulcerating area with change of dressings every two or three days than from the use of the Unna cast. We reserve the use of the cast entirely as a supportive measure after the ulcer has healed. This continued support is essential if we hope to keep the condition cured. The author did not emphasize the importance of the close relation and association of the varicose veins to the ulcerating areas. This is very definite. Here, often, the ulcer is kept active solely by the presence and congestive influence of one vein. This relation is discussed in detail in my last article on the subject, which will be published in the next few months. We have treated 400 cases of varicose veins by this method, in seventy-five of which there were ulcerating conditions.

DR. A. F. BRATRUD, Minneapolis: We have noted flat feet in from 25 to 50 per cent of patients with varicose veins. It is remarkable what an improvement we see in some of these patients who have been treated for flat feet after we have treated their varicose veins. I started the ambulatory excision of varicose veins in 1915. Few complications resulted; but one that resulted very often was infection. On that account it was given up. After starting the injection treatment of varicose veins, I treated a series of cases with parathyroid extract given by mouth. Very little, if any, improvement was noticed, so this treatment was discontinued. However, these cases were not supplemented with injections or by supportive treatment, which is essential. Some complications occur. Occasionally there are sloughs. That is probably due to an error in technic or to the injection of too large a quantity of solution. These sloughs should be treated properly. They can be excised completely in anywhere from ten to fourteen days. Otherwise, it may be necessary to treat these cases from three to five months for the slough before healing takes place. Eczema of the upper extremities has been reported as having been cured by the injection of varicose veins of the upper extremities. I disagree slightly with Dr. de Takáts in regard to using the injection treatment in pregnancy. We do inject many varicose veins in pregnant women, but we do not use any solution that is liable to produce abortion; that is, any quinine solution. It is really surprising what relief these patients experience after the obliteration of the varicose veins by the injection treatment, especially the large veins in the popliteal space. In a few cases large veins and numerous varicosities were opened and the sclerosing solution was injected. The results were good and the period of treatment was much shortened. However, here one does just what we are trying to get away from. With the injection treatment there is a thrombus that is attached to the walls of the vein, but if the vein is ligated a thrombus results above the ligation that is liable to become free and produce a pulmonary infarct or an embolism. This complication occurs in about 1 per cent of cases in surgery of the varicose veins.

DR. R. C. LOGEFEIL, Minneapolis: This is by no means a new method. It was introduced in 1851 by Pravatz, and many men have been using it in Europe since that time. It was not put on a safe basis, however, until 1894, when it was shown by Delores that the results of the treatment were due to the effect of the solution on the intima of the vein rather than to the solution itself. Linzer, Noble and Sicard have probably been the ones who have done the most work in Europe and have put it on a safe and sane basis; they have shown, at least

to the satisfaction of most European clinics, that it is a safe and conservative method of treatment of varicose veins. The dangers, as have already been shown, are really mostly theoretical and have not reached anywhere near the high percentage that we find with surgery. The symptomatic relief that these patients obtain is remarkable. A number of my patients who were previously operated on with recurrence have returned for treatment by the injection method. In every case they much prefer the injection method because of the fact that they are not laid up for a long time, it is less painful, the cosmetic effect is better, the symptomatic relief comes sooner and the total cost is very much less to the patient; usually the cost of a complete injection treatment is no more than the ordinary hospital bill for surgery. Whatever solution is used to produce a sclerosis, the main thing is to get the solution into the vein in contact with the intima for a period of five minutes so that a complete irritation or destruction of the intima will follow. Then a sclerosis can be obtained. I prefer the invert sugar preparation to the dextrose or the other solutions, principally because of the fact that one can get a thinner solution than with the dextrose solutions. Dextrose solution is quite thick and necessitates a large needle, which is somewhat difficult to get into the vein and which causes more pain. Sodium chloride and salicylate solutions produce severe cramps and sloughing if some is accidentally injected outside of the vein. This is not true of the invert sugar preparations. Invert sugar can be used up to 70 per cent, and if it is warmed to body temperature, it is still a fluid solution and can usually go through an 18 to 21 gage needle.

DR. GÉZA DE TAKÁTS, Chicago: There is one important point that I should like to mention at this time: the type of solution we have used. We are still using dextrose and not sodium chloride or sodium salicylate because we have found that it is the blandest solution, a solution that does not always give the promptest result, but a solution that does cause the least reaction. We have used sodium chloride in a number of cases; we have used quinine and urea; we have used sodium salicylate. We have always come back to dextrose. Whether we use invert sugar or dextrose does not seem to make much difference, because, after all, it is a question of using a hypertonic solution. As to the use of parathyroid extract, I believe that so long as we are not making any routine blood calcium examinations we have absolutely no right to use parathyroid extract, because the only justification for using parathyroid extract would be a low blood calcium level, and I have not seen in the literature any conclusive proof that in the case of varicose veins and ulcers there is a low blood calcium. Theoretically, there is no reason why there should be. A continued use of parathyroid extract with a normal calcium level may easily lead to hypercalcemia, with all its dangers.

Calhoun.—His was the hand which restored to countless hundreds the priceless heritage of sight.—Dr. De Schweinitz's Tribute to Dr. Abner Calhoun, *J. M. A. Georgia*, February, 1929.

ACUTE OSTEOMYELITIS *

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Acute pyogenic osteomyelitis has been termed a pyemia occurring during the period of growth in which the inflammatory changes in the bones predominate in the clinical picture. While there may be a question as to whether the term general infection should be applied to processes in which bacteria are not found in the blood from time to time, or increase in it, there can be no question as to the hematogenous origin of the disease and its close relation to general pyogenic infections with metastases. It should be remembered in this connection that staphylococci seem to use the blood as a means of transport and that they not infrequently disappear from it, to be delivered into it again at some other time.

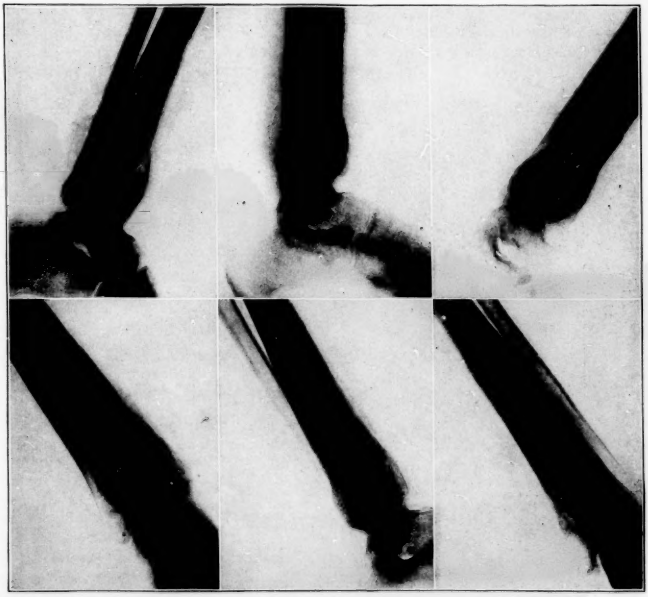

Fig. 1.—Changes occurring in bone followed by recovery and repair after early drainage in acute pyogenic osteomyelitis. The operation was performed eleven hours after the beginning of symptoms. The focus in the cancellous bone was opened by a burr. Definite changes may be seen in the marrow. Recovery occurred without sequestrum formation. Considerable brawny induration was noted over the lower third of the leg, which persisted for about three months.

Accumulating clinical and bacteriologic experiences indicate that the clinical course of the disease varies considerably with different organisms. Lannelongue and Achard, in 1890, made the first communication relative to streptococcic osteomyelitis. Osteomyelitis caused by the streptococcus is characterized by a severe general reaction, the formation of large quantities of pus which spreads rapidly, and limited changes in the bone. The marrow seems to be a less favorable medium

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for the growth of streptococci than of staphylococci. In streptococcic and pneumococcic osteomyelitis observed in young children, single or multiple joint involvement, accompanied by separation or destruction of the epiphysis, is not infrequently seen. Such types of osteomyelitis may appear clinically as an arthritis, the primary bone lesion being discovered later. Kocher reports such a case in a girl, aged 6 years. The first symptoms suggested an inflammation of the hip. The head of the femur was involved and later the epiphysis separated. In this case the bone marrow and trochanter were not involved. The acute catarrhal suppurative arthritis described by Volkmann, which occurs in young children, usually under 4 years of age, and attacks the larger joints is usually an osteomyelitis caused by the streptococcus. Many such cases are regarded as arthritis and treated as such, the cortical focus in the bone just on the shaft side of the epiphyseal cartilage being discovered late in the course of the disease.

Lexer contributed a great deal to the knowledge concerning the cause for the localization of the infection,

Fig. 2.—Acute pyogenic osteomyelitis: The periosteum was stripped by a subperiosteal abscess, which was drained by periosteal incision. Bone, which might have been regarded as dead, has taken active part in repair.

when he demonstrated by injections the arrangement of the vessels in the metaphyses of long bones. His work also demonstrated why the disease is one of the growth period. The loop formation in the vessels of the primary areolae among the cartilage cells leads to a slowing of the circulation, which favors the lodgment of bacterial emboli and determines the location and development of the inflammatory focus.

Knaggs, referring to the arrangement of the blood vessels, states that "it is possible that this anatomical fact may have some bearing upon the matter, but that given the presence of organisms in the blood there can hardly be any doubt that trauma is responsible for their escape into the juxta-epiphyseal tissue."

Acute osteomyelitis in the adult differs considerably from that observed in the growing period. The initial focus in the adult no longer occurs in well defined locations and the incidence of the disease is greatly reduced. Such differences would seem to emphasize the importance of the vascular arrangement in the metaphysis as one of the principal determining factors in the development of osteomyelitis. Trauma is probably as common in the adult as in the young, but the frequency with which osteomyelitis develops decreases with ossification of the epiphysis.

The way in which the infection, once established, spreads has been the subject of more or less controversy. It is important to determine this, because the line of treatment may be indicated by it. Considerable light has been thrown on it by careful roentgen studies. According to Starr, the older and more or less accepted theory is that the primary spread is through the cancellous bone to the medullary cavity, and it is stated in textbooks of surgery that within one or two days the entire medullary cavity will become infected. From the medullary cavity the spread is noted as taking place through the haversian canals to the periosteum and also by way of the metaphyseal region to the periosteum.

According to Starr it is possible to demonstrate, and has been demonstrated by autopsy studies in early cases and by animal experimentation, that the chief and early spread is not toward the medulla but by way of the tissues of the metaphysis to the periosteum. This membrane is raised from the cortex and separated more or less rapidly from the bone, depending on the virulence of the infecting organism. That the medullary canal may become extensively infected is not doubted, but apparently it is often infected by back pressure from the subperiosteal region through the haversian canals. Starr, in discussing one of his cases which came to autopsy, makes the statement that "if the tension of the purulent exudate were relieved at an early stage in the case of a living patient by an incision from the surface through the periosteum, the stripping would cease and the sequestration would be confined to the more or less triangular area, with the epiphyseal line as a base and the apex at the upper point of stripping of the periosteum from the cortex." This statement is made regarding an acute osteomyelitis beginning in the lower end of the femur. These observations are of great importance, for they indicate the line of procedure in the treatment of acute osteomyelitis and the relation that periosteal stripping caused by the tension of the exudate may have to sequestrum formation.

The possibility of a suppurative lesion of the marrow occurring without periosteal stripping and sequestrum formation is indicated by the following case:

CASE 1.—J. M., a man, aged 30, admitted to the hospital, Nov. 18, 1920, about three months before admission had complained of pain in the left arm and the lower part of neck, which had not been severe. At one time a diagnosis of cervical and brachial neuritis had been made. The patient's teeth were bad, a marked pyorrhea being noted. Several teeth were extracted. Three weeks before entering the hospital, while playing golf, he experienced severe pain in the arm and had chills with high fever. The pain continued with varying degrees of severity, accompanied by some fever. Three days before he entered the hospital a swelling developed on the outer side of the left arm near the middle. Fluctuation developed later. An operation performed the morning the patient entered the hospital showed that the suppuration had extended through the cortex. The cortical bone was removed for some distance and dead, broken-down marrow was exposed. This was removed. Small spicules of bone were found, but no gross sequestration was noted.

December 2, after leaving the hospital, the patient again had chills and fever. Severe pain was experienced in the upper part of the humerus. A definite point of localized tenderness was found. The humerus was again exposed and some cortical bone removed. Dead, suppurating marrow was found in the upper

part of the humerus and was carefully removed. No gross sequestration was noted. Healing occurred rapidly and the patient has remained well.

Suppuration of the marrow without involvement of the remaining bone occurred in this case. Perforation directly through the bone and periosteum without stripping of the latter had occurred.

The following two cases are cited to indicate the possibility of repair following early drainage without sequestrum formation and of bone, which might be regarded as dead, being viable and taking part in repair:

CASE 2.—A well developed boy, aged 16, had enjoyed perfect health until October, 1927, when he noted severe pain about the left ankle. On examination a definite point of tenderness was found over the lower end of the left tibia. A diagnosis of acute osteomyelitis was made, although the tenderness had been noted for only eight hours. The roentgenogram at that time did not demonstrate any bone change. The patient was examined at noon, and at 3 o'clock that afternoon an operation was performed by Dr. Rienhoff. A perforator about the size of a little finger was used to open the bone. The point of tenderness had been marked on the skin before the patient was anesthetized. The perforator came directly on the abscess when the cortical bone was perforated. The patient remained in the hospital two weeks, during which time hot, moist dressings were placed about the leg and foot. A good deal of brawny induration developed in the lower part of the leg which corresponded to the area involved, as indicated by the roentgenogram. Induration and tenderness persisted for a period of three months. Discoloration appeared in the region of induration. This was coffee colored, similar to that seen about old varicose ulcers.

During the succeeding months the induration and tenderness, as well as the discoloration, disappeared, and repeated roentgenographic examinations show that bone repair is going on and that a sequestrum did not form.

The next case is cited to indicate how little sequestration may occur without periosteal stripping, and that bone which is apparently sequestrated may be viable and take part in repair. The patient, who had acute osteomyelitis, was operated on a little more than a year and a half ago by Dr. W. A. Fisher, Jr.

CASE 3.—A woman complained of pain over the lower third of the forearm. Swelling and redness were noted. An incision was made through the soft tissues and periosteum, and an abscess, which seemed to communicate with the marrow cavity, was drained, although, when the operation was performed, no such communication was found. Drainage continued for two months. It then ceased and the induration and swelling of the forearm subsided. Some sequestration seemed to have occurred in this case, but the restoration of bone has continued and at the present time the patient's forearm is practically normal, except for the scars that followed incisions for drainage. The operation—drainage of the subperiosteal abscess—was performed forty-eight hours after the beginning of symptoms.

Case 4 is cited to show the different stages in the repair of osteomyelitis with reconstruction of the bone.

CASE 4.—A child was struck on the shoulder with a railroad spike four days before admission. There was no break in the skin. On the following day pain was noted in the right shoulder; the child was restless, and fever developed. The symptoms increased in severity and the arm became red, swollen and tender. The temperature on admission was 104 F., and the patient was septic and irrational. The child was admitted to the hospital eight times from Sept. 17, 1921, to July 3, 1925. A small sequestrum was removed from the left radius, Nov. 3, 1921. Jan. 4, 1922, part of the shaft of the humerus which had been sequestrated was removed. Later a pathologic fracture occurred. May 22, 1922, sequestrums were removed from the upper and middle portions of the left humerus. Oct. 23, 1923, a rib resection was performed for acute empyema. At the last admission, July 3, 1925, an abscess had developed on the outer side of the left arm just above the elbow. This was drained. No sequestrum was found. The shaft of the humerus has been reconstructed, but removal of the sequestrum was delayed until it was fully separated.

This report is based on a study of 229 cases of osteomyelitis. A differentiation is not made between acute and chronic cases. In one of the cases cited, operation was performed within eleven hours after the onset. The patients were, however, rarely admitted to the hospital until from four to seven days after the beginning of the attack.

There are included in this study eighty-eight cases of osteomyelitis of the femur. Nine of these patients died. Three deaths followed attempts at removal of large, almost total, sequestrums. This experience indicates that too radical a procedure should not be attempted in patients whose resistance has been lowered by long illness. The remaining six deaths were due to general pyogenic infections with metastases. Three of the patients with osteomyelitis of the femur were unimproved; fifty-nine, or 67 per cent, were discharged as improved, while seventeen, or 19.3 per cent, were discharged as cured. The percentage of improvement is high, but improvement usually means a discharging sinus or unhealed wound and indicates that surgery has not attained its aim—a healed wound. Some effusion or other evidence of joint involvement was noted in a relatively large proportion of cases. The knee was involved in forty-four of the eighty-eight cases, the hip in twenty-five and the hip and knee in seven.

Fig. 3.—Acute pyogenic osteomyelitis of the upper end of the left humerus: The abscess was drained. The sequestrum was not removed until separation was complete. Removal of the sequestrum could then be done without injury to healthy bone. Bone was not sacrificed at a time when it might have been difficult to differentiate between living and dead bone.

There were sixty-one cases of osteomyelitis of the tibia; two deaths occurred in this group. Thirty-seven, or 60.6 per cent, of the patients were discharged as improved; two as not improved and twenty, or 32.6 per cent, as well. The two deaths were due to general infections.

There were sixty-three cases of osteomyelitis of the humerus. One death occurred in this group; forty-nine patients were discharged as improved, one as unimproved and twelve as well.

The elbow was involved in twenty-one and the shoulder in nineteen of these cases; both the shoulder and elbow were involved in five, and in 64.5 per cent one or both joints were involved.

One cannot but be struck by the number of patients, about 50 per cent who were discharged as improved. Multiple operations were required for recurring attacks and abscesses. Because such recurrences are so com-

mon, some surgeons believe that osteomyelitis is never cured.

I believe that some of the operations which have been suggested for osteomyelitis are harmful. Any operative procedure employed in the treatment of acute osteomyelitis should have as its objects the prevention of general infections, the limitation of sequestration or reduction in the size of the sequestrums, and the prevention of deformities.

In 1920 Rost sent out questionnaires as to what procedure should be followed in the treatment of acute osteomyelitis when a subperiosteal abscess had formed. Some of the surgeons, Garré and Lexer in particular, emphasized that an operation should be performed in acute pyogenic osteomyelitis before a subperiosteal abscess formed. There will be no argument over this view. Several surgeons advocated removal of the cortex only when there were signs that the marrow was infected, indicated by the discharge of pus through the haversian canals; while others advocated removal of the cortex and drainage of the marrow cavity if the fever did not subside and improvement occur after incision of the subperiosteal abscess. Trendelenburg, Wilms and Sauerbruch advocated simple incision.

An opportunity to compare the results of the two methods of treatment occurred in the Heidelberg clinic. Wilms in all patients with a subperiosteal abscess or an abscess of the soft parts merely drained

Miscellaneous Group

	Well	Improved	Died
Fibula, 2	1	..	1
Metatarsal, 2	2	..	..
Ilium, 5	1	2	2
Skull, 3	2	1	..
Clavicle, 1	..	1	..
Radius, 3	2	1	..

the abscess. If the temperature did not fall the incision was enlarged, counterincisions were made, or a suppurating joint, if present, was drained. The cortical bone was not trephined or removed by Wilms. Enderlen succeeded Wilms at Heidelberg. His practice was wide removal of the cortical bone. An opportunity was had to compare the two methods. Two hundred and twenty-six patients were studied. In seventy of these the marrow cavity was exposed early by the removal of cortical bone. Ten of these patients died, giving a mortality of 14 per cent. In 156 patients the marrow cavity was not exposed, drainage of the subperiosteal abscess being instituted. Twelve of these died, giving a mortality of 7 per cent.

Deaths due to general infections did not occur any more frequently after incision than after exposure and drainage of the marrow cavity. There was no difference in the size and number of sequestrums in incised bone and in bone in which the marrow cavity was exposed after removal of the cortex. In this connection Trendelenburg and Hofmeister have often stated that they were astonished to find that not infrequently small sequestrums formed in cases in which the subperiosteal abscess was incised, even when there was considerable periosteal stripping.

There are definite disadvantages of removing the cortex to expose the marrow cavity, such as exposure of healthy marrow with the possibility of subsequent infection, traumatism of the bone and stripping of the periosteum, which may lead to more extensive sequestrum formation.

As is indicated by the figures cited in the 229 cases discussed in this series, acute pyogenic osteomyelitis still remains a surgical problem. The question naturally arises, How can the results be improved?

It is not necessary to emphasize the importance of an early diagnosis, although most of the patients in this series were not admitted to the hospital until the disease had existed for at least from four to seven days. The diagnosis must be based on pain, which is the constant, predominant and earliest symptom of acute osteomyelitis, and a definite localized point of tenderness limited in area and not found over the surrounding bone. During the first twenty-four to thirty-six hours, pain, localized tenderness and fever may be the only symptoms of the disease, as the inflammatory process is confined to the interior of the bone and has not yet reached the periosteum, when redness, edema and induration of the skin are noted.

If the sequelae of acute osteomyelitis—discharging sinuses or reformation of sequestrums—are to be avoided, the diagnosis must be made early and an early operation performed. When the diagnosis is made the supporting focus should be drained by a trephine opening or a burr, and the tension immediately relieved. This operation a few years ago was denounced by some very capable surgeons. If a subperiosteal abscess has formed, this should be drained and further stripping of the periosteum or injury of the bone carefully avoided. Removal of the sequestrum should be delayed until it is fully separated, for it is impossible to determine what bone is viable before separation has occurred, and the injury of surrounding viable bone may be followed by sequestrum formation later. The radical operation does not lessen the incidence of general infection. Radical removal of an infected marrow with a curet may favor the development of general infections and destroy bone.

The development of deformities should be prevented. The surgeon can prevent these. The possibility of a dorsal dislocation of the hip should always be kept in mind in inflammatory processes about the hip, especially in osteomyelitis of the upper and posterior part of the rim of the acetabulum, which is supplied by an artery that may be closed by an infected embolus.

Improvement in the treatment of acute osteomyelitis depends on early diagnosis and the resort to drainage of the inflammatory focus in the bone. Periosteal stripping should be prevented. If a subperiosteal abscess has formed, this should be incised. Removal of the sequestrum should be postponed until it has completely separated, so that in removal healthy surrounding bone will not be injured by operative procedures. Trauma to surrounding bone may lay the foundation for the formation of a new sequestrum.

The trend in the treatment of acute osteomyelitis is toward conservatism.

Johns Hopkins Hospital.

The Alleged Effect of Diagnostic Specialties.—Radiology is sometimes blamed for the disappearance of the skilful diagnostician. So is bacteriology. It is said perhaps truly that there is an increasing tendency to resort to the x-ray department and the laboratory for a diagnosis without having recourse to a systematic routine examination and a careful analysis of symptoms and signs. Both specialties so frequently appear to establish a diagnosis that inspection, palpation, percussion and auscultation, it is alleged, are becoming a lost art.—Hayes, M. R. J.: The Rôle of Radiology, *Irish J. M. Sc.*, December, 1928.

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THE TETRALOGY OF FALLOT

REPORT OF A CASE IN A NOTED MUSICIAN, WHO LIVED TO HIS SIXTIETH YEAR

PAUL D. WHITE, M.D.
AND
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BOSTON

In 1888, forty years ago, Fallot [1] published an interesting, useful and complete description of a type of congenital heart disease that at times had been described previously but was quite neglected in its full significance. Though this condition is now recognized under his name as the tetralogy of Fallot, it is still much neglected and but little known. His article might well be reproduced in full as quite up to date in 1928.

The tetralogy of Fallot consists of the most common grouping of congenital cardiac defects found in adults, namely, (1) pulmonic or infundibular stenosis; (2) interventricular septal defect; (3) dextroposition of the aorta, so that it overrides the septal defect and thus receives blood directly from the right as well as from the left ventricle, and (4) marked hypertrophy of the right ventricle. Clubbing of the fingers and cyanosis are invariably present.

Life is usually short when this serious disturbance of the circulation is present, and the victim is generally so crippled that he is unable, or at least is made to think that he is unable, to accomplish anything worth while. The oldest patient in Fallot's original series was 36 years of age at the time of his death and in the past forty years, so far as we have been able to learn, the condition has not been recorded in any older person. Maude Abbott [2] has also informed us that she does not know of any patient older. Up to the present, we have ourselves encountered only one patient with the proved tetralogy of Fallot who lived even so long as twenty-three years, and this case was reported by us in 1927.[3]

Fig. 1.—Portrait of Henry F. Gilbert, American composer. The cyanosis of the cheeks and hands, and the clubbing of the fingers can be detected.

A little more than a year ago we were consulted by Henry F. Gilbert, American composer, for advice about going abroad to Frankfort to attend the presentation of one of his works at the international musical festival to be held there in the summer of 1927. This occasion was to prove to be the peak of his professional career. We were amazed to find on examination that he showed all the characteristics of Fallot's tetralogy, and although at that time his age was 58, surpassing by twenty-two years that of any previously reported patient, we ventured to make the diagnosis of pulmonic or infundibular stenosis with interventricular septal defect. As a unique case we so described it then, a year before the patient's death.[3] It was obvious that his long life had been in large measure due to the great care he, and particularly his wife, had taken of him, even amidst hardships that will be recounted later. And so, in spite of his cyanosis and clubbing, dyspnea and weakness, headaches and faint spells, we advised him to make the journey to Europe, fortifying a little his weary heart and combating increasing dyspnea by digitalization and its maintenance. This visit to Europe was highly successful and Gilbert received some of the acclaim which was his due and which would have come to him in increasing degree with increasing years. He returned to America in fairly good health and continued his active though guarded musical career until his unfortunate death from apoplexy a year later, within a few months of the age of 60. Postmortem examination revealed the tetralogy of Fallot.

We are eager to publish the story of this man's life, not so much because he outlived others by many years but particularly because he made his life so worth while in spite of the great handicap from which he suffered. We hope that his story will prove a help and inspiration to many other cardiac cripples.

FALLOT'S MONOGRAPH

Before the presentation of the details of our case, a few observations from Fallot's monograph will be of interest and value.

In the course of thirteen years, Fallot himself was able to study at postmortem examination the hearts of three patients showing the tetralogy of pulmonic or infundibular stenosis, interventricular septal defect, dextroposition of the aorta and enlargement of the right ventricle. He referred to the thesis of Debely published in 1878 which described the observations in twenty cases of the maladie bleue collected from the literature, nineteen of which conformed to the condition that Fallot found in his three cases, but the true significance of which Debely missed. Fallot then reviewed the additional cases of maladie bleue reported in the literature from 1878 to 1888 and of the fifty-five new cases

1. Fallot, A.: Contribution à l'anatomie pathologique de la maladie bleue (cyanose cardiaque), Marseille méd. **25**: 77, 138, 207, 270, 341 and 403, 1888.
2. Abbott, Maude E.: Personal communication to the authors.
3. Kurtz, C. M.; Sprague, H. B., and White, P. D.: Congenital Heart Disease: Interventricular Septal Defects with Associated Anomalies in a Series of Three Cases Examined Post Mortem, and a Living Patient Fifty-Eight Years Old with Cyanosis and Clubbing of the Fingers, Am. Heart J. **3**: 77 (Oct.) 1927.

(including three of his own) found thirty-nine in accord with this tetralogy.

The details of Fallot's cases were, in brief, as follows:

CASE 1.—The heart of a youth, aged 19, was examined post mortem in 1874. The stenosis of the pulmonic valve resembled a diaphragm pierced by a narrow opening in the center with a canal-like infundibulum below it. The enlarged aorta was situated with its valve opening riding equally over the right and the left ventricular chambers. The wall of the left ventricle was 1.2 cm. thick and that of the right ventricle, 1.1 cm. thick.

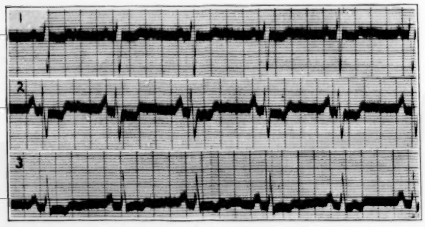

Fig. 2.—Electrocardiogram taken, March 8, 1927; leads 1, 2 and 3, normal rhythm, rate 66; right axis deviation, index — 18, angle + 140 degrees. P wave, lead 2, 5 mm. amplitude, 0.15 second duration. Diphasic T wave in all leads. (Scale on the abscissa is 0.2 second and on the ordinate is 10^{-4} volt.)

CASE 2.—A man, aged 26, a mason, whose death was due to pneumothorax from rupture of the lungs as a result of extensive tuberculosis, had had a double stenosis of the pulmonic valve above and of the infundibulum of the right ventricle 1 cm. below the valve. The aorta opened entirely from the right ventricular chamber and the interventricular septal defect, 1.5 cm. in diameter, acted as a canal to the aorta from the left ventricle. The wall of the left ventricle was 1.2 cm. thick and that of the right ventricle, 1.6 cm. thick.

CASE 3.—A man, aged 36, a coachman, died as a result of bacterial endocarditis involving the aortic valve. There was also extensive pulmonary tuberculosis. The pulmonic valve was thickened, retracted and stenosed, and there was infundibular stenosis of the right ventricle with a channel from 1.5 to 2 cm. long leading up to the valve. This channel was of the caliber of a large pen holder and was lined with wrinkled thick white endocardium resembling scar tissue. The aortic opening overrode the septal defect one third over the left ventricular chamber and two thirds over the right. The wall of the left ventricle measured 1.4 cm. in thickness and that of the right, from 1.4 to 1.7 cm.

The last patient Fallot had correctly diagnosed during life as having this tetralogy. This patient was the oldest of those reported, except for a woman, aged 36 years at death (patient 6 of Fallot's series), cited by Revilliod in 1881 before the Société anatomique. She had been cyanotic since birth and showed a loud systolic murmur at the base of the heart. Postmortem examination revealed a large right ventricle with interventricular septal defect and pulmonic stenosis. The pulmonic valve had only two cusps and there was a dissecting aneurysm of the pulmonary artery due to rupture of its inner and middle coats 2 cm. above the valve.

Fallot's conclusions are worth repeating in detail:

1. Clinicians have until now considered the precise diagnosis of the anatomic lesions of congenital heart disease with cyanosis (la maladie bleue) as almost impossible and to be expressed in the form of an entirely vague and uncertain hypothesis. From observations that we have assembled it appears on the contrary that congenital heart disease with cyanosis, above all in adults, is the result of a small number of perfectly definite cardiac malformations.

2. Of these cardiac malformations there is one which in frequency surpasses all others, since we have met it in almost 74 per cent of our observations: it is this malformation then that the clinician will be justified in diagnosing and in so doing the chances of error which he will run will be relatively few.

3. This malformation constitutes a true pathologic-anatomic type represented by the following tetralogy: (1) stenosis of the pulmonary artery, (2) interventricular septal defect, (3) deviation of the origin of the aorta to the right and (4) hypertrophy of the right ventricle, almost always concentric in type. At times there is an additional entirely accessory defect; namely, patency of the foramen ovale.

4. One cannot at the present time attribute the maladie bleue to the persistence of the foramen ovale without direct opposition to the great majority of observed facts; when the communication between the two auricles exists alone without any other associated cardiac lesion, cyanosis does not result.

5. From the historical point of view one finds, in the writings of the last century (the eighteenth) and of the beginning of the present, frequent observations of congenital heart disease with cyanosis; the majority present the interesting combination of the various cardiac lesions mentioned above.

6. Finally, from the pathogenic point of view the theory that considers the interventricular communication as a simple phenomenon belonging to the group of recessive anomalies rests only on a superficial and inexact interpretation of the facts; the incompletely developed septum in the victim of the maladie bleue can be considered in no way as the analogue of the false septum of vertebrate animals with communicating ventricles—it appears much more logical and more in keeping with physiologic laws to regard the entire series of cardiac anomalies enumerated above as the consequence of the stenosis of the pulmonary artery. As to the cause of this pulmonic stenosis we believe that we should attribute it not to a simple arrest in development but rather to a pathologic process occurring in the region of the pulmonary valve and of the infundibulum just below it during intra-uterine life.

REPORT OF THE PRESENT CASE

Henry F. Gilbert, American composer (fig. 1), was born of old New England stock in Somerville, Mass., Sept. 26, 1868, and died in Cambridge, May 19, 1928, within a few months of 60 years of age. His father was a composer and organist and his mother was a singer. His wife was a perfect comrade and in every way helped him in his life's work. Two daughters have inherited his artistic spirit.

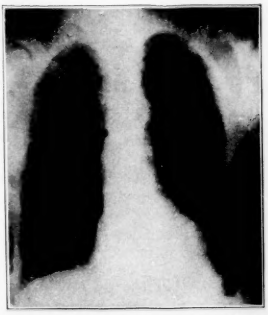

Fig. 3.—Roentgenographic appearance of heart at 7 foot tube distance. Heart shadow round and increased transversely owing to right ventricular enlargement. In the region of the pulmonary conus the shadow is concave and does not show the prominence often seen in cases of patent ductus arteriosus. The pulmonary artery in this case was hypoplastic.

He was crippled by his heart from birth and was unable to play so vigorously as other boys because of dyspnea and fatigue. From earliest childhood cyanosis of his face and clubbing of his fingers were prominent, and frequently doubt was expressed by physicians as to his survival to adult life. Even at this early age he had dizzy spells and frequent headaches and these troubles continued throughout his life. As he grew older he was now and then thought to be intoxicated because he staggered

in a faint spell and sometimes actual syncope occurred, once during the rehearsal of one of his pieces. He was always short of breath and easily exhausted and forced to avoid hurry and overexertion. He had pain in the chest and coughed when he had a cold during the winter but not constantly. Otherwise there were no symptoms, except for several occasions during the last half of his life, when there were attacks resembling transient apoplexy, with weakness of the arm, hand or leg for a few hours or a few days, apparently passing off completely. At last in May, 1928, complete left hemiplegia developed and death resulted after a week of partial coma, the heart carrying on a satisfactory circulation up to the end.

About a year before his death, digitalization was carried out apparently with some increase in the cardiac reserve and this digitalis effect was maintained thereafter. Other therapy was only symptomatic but consisted chiefly of great care, particularly exerted by his able and devoted wife. Constant watchfulness on her part to avert fatigue and exposure to infection doubtless contributed greatly to his length of life and to his professional success.

As a boy and young man he became interested in music, to which in many vicissitudes he remained devoted throughout life. Many a weaker spirit would have faltered, not only because of the handicap from his crippled heart but also because of the struggle against poverty and privation. As a young man Gilbert studied with Edward MacDowell on the latter's return from Europe, produced some noteworthy music of promise, and earned a little money in hotels and theaters with his violin; but for years after that he had to abandon much of his music in order to earn a scanty living as best he could as a printer and a clerk. In 1901 at the age of 33 he learned of the Parisian opera "Louise" by Charpentier. He went to Europe in a cattle boat to hear it and was so thrilled by it that he thereupon determined to devote the rest of his life to the development of a native American music. He returned to New England and for the next twenty-seven years struggled to accomplish this purpose, suffering penury and want, and beginning his venture in a barn in Quincy, Mass. Recognition by the world of the success of his efforts was just coming at the time of his death, this recognition belated as it often is and with promise of increasing greatly in the years to come. One high point at least came in the summer of 1927, when he was selected as one of the only two American composers whose works were given a place at the international musical festival in Frankfort, Germany. Compositions of his had been played previous to this by the Boston Symphony and other orchestras, including those throughout Europe; but as he had never catered to popular fad or fancy and had shunned social events and intercourse, he was not widely known to the public. Those who know best consider him one of our greatest musical figures and the pioneer of a native American music. His best known compositions are "Comedy Overtures on Negro Themes," "Negro Rhapsody," "Prologue to Riders to the Sea," "Indian Sketches," "Dance on Place Congo," "Nocturne for Orchestra," "Pirate Song," "The Island of the Fay" and the "Fish Wharf Rhapsody." It was his "Dance on Place Congo" that was played in Frankfort in the summer of 1927, and only last March (1928), two months before his death, he was acclaimed at the première performance of his composition "Nocturne for Orchestra" in Philadelphia by the Philadelphia Orchestra under Pierre Monteux.

It was for advice as to the journey to Europe last year that Mr. Gilbert first consulted us. This was on March 8, 1927. Increase of fatigability and dyspnea, and uncertainty as to his ability to stand the strain of the visit to Frankfort, were the points for our consideration. We advised his going after digitalization, and the trip was made successfully during the summer. In the fall (September and October, 1927) we found him in better condition than in the spring. In the summer and fall following his return from Europe he finished a large chamber orchestra piece which had its première preformance, April 28, 1928, under Nickolas Slominsky in Jordan Hall, Boston. In March, 1928, he lectured at Harvard University, though with some difficulty because of his physical condition.

Physical Examination.—At the time of our examination, March 8, 1927, the patient, of average size with shaggy iron gray hair, had marked florid cyanosis of the face, ears and fingers; he breathed heavily on rather slight exertion and was humorously tolerant of all the fuss being made in behalf of his health. There was marked clubbing of the fingers and toes. The eyes were alert but somewhat suffused. The patient's sight was excellent. The pupils were equal and circular and reacted normally to light. There was no arcus senilis. The teeth were false (in years past he had had much trouble with bad teeth, which were finally removed, to his great relief). The throat was not remarkable. The cervical veins were slightly more prominent than normal. The thyroid gland was normal. There was no evidence of abnormal collateral circulation anywhere over the body.

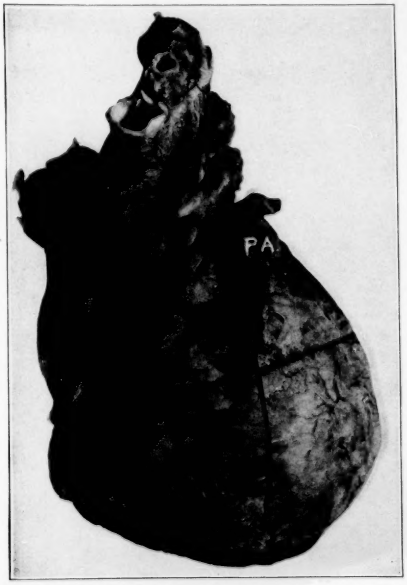

Fig. 4.—Anterior surface of the heart after chambers had been opened and the pericardium removed. The ventricular surface was made up almost entirely of the right ventricle. *P A*, pulmonary artery.

The heart showed moderate enlargement, with the maximal apex impulse felt with some difficulty and the left border of dulness made out by percussion in the fifth intercostal space 9.5 cm. to the left of the midsternum, and 2 cm. beyond the

midclavicular line. There was no abnormal dulness to percussion at the left upper border of the heart, to the right of the sternum, or in the region of the great vessels. There were no abnormal pulsations. The sounds were of fair quality, except that the first sound was in part masked over the entire precordia by a moderately loud blowing systolic murmur, at times harsh, maximal in the fourth intercostal space just to the left of the sternum, only faintly heard in the aortic area, and not transmitted to the back or to the vessels of the neck. A slight systolic thrill was palpable in the fourth left intercostal space. There were no diastolic murmurs in any position. The second sound at the base was not accentuated. The rhythm was regular and the rate was 60. The systolic blood pressure was 110 mm. of mercury and the diastolic 80. The radial pulses were small and equal and the artery walls were soft.

The lungs were clear. The abdomen was normal. The liver and spleen were not felt. The genitalia and extremities did not show any abnormalities except for clubbing and cyanosis and coldness of the fingers and toes. The knee jerks were equal and normal.

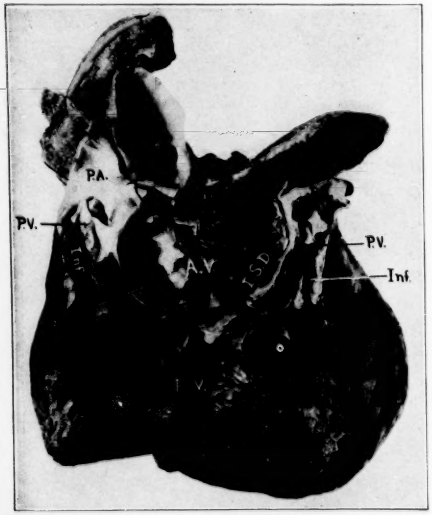

Fig. 5.—Interior of heart exposed through right ventricle. Note thick right ventricular wall: *T V*, tricuspid valve; *A V*, aortic valve. *I S D*, interventricular septal defect; *P A*, pulmonary artery; *Inf*, infundibulum; *P V*, pulmonary valve cusps (bicuspid).

From this time on for the rest of his life (fourteen months) there was no change on physical examination except for the development of temporary bilateral olecranon bursitis in January, 1928, and for the complete left hemiplegia during the last eight days of his life (May 11-19, 1928).

Laboratory Data.—An electrocardiogram (fig. 2) showed normal rhythm at a rate of 65, marked right axis deviation (index —18, angle + 140 degrees), prominent P wave in lead II (4 mm.), and diphasic T wave in all leads. This is characteristic of pulmonic stenosis.

A roentgenogram of the heart and the great vessels (fig. 3), taken with the tube 7 feet from the chest, showed slight to moderate cardiac enlargement and slight tortuosity of the aorta. The heart was normal in shape. The measurement to the right of the midsternal line was 3.8 cm.; to the left, 9.2; the total transverse diameter, 13; the long diameter, 13.3, and the broad diameter, 11.1. The width of the great vessels was 5.4, and the internal diameter of the thorax was 25.1. Thus the cardiothoracic ratio was 13.0 : 25.1, which is a little above the normal.

Examination of the blood showed a hemoglobin of 110 per cent, and a red blood cell count of 7,700,000.

The urine was normal except for a slight trace of albumin and a few granular casts in the sediment.

Postmortem Examination.—At the postmortem performed by Dr. Tracy B. Mallory, May 21, 1928, only the thorax was opened. The lungs did not show any consolidation.

The heart weighed 450 Gm. Its shape was abnormal in that the right ventricle was much hypertrophied, increasing the breadth and blunting the apex, two thirds of which was made up by the right ventricle and only one third by the left (fig. 4). The transverse measurement across the ventricles at the widest point was 11.5 cm.; the length from the base of the aorta to the apex was 10 cm. and from the superior vena caval opening in right auricle to the apex, 13 cm., while the anteroposterior thickness of the ventricles was 7 cm. The apex measured 4.5 cm. in breadth. Five sixths of the anterior ventricular surface of the heart was made up of the right ventricle, while two fifths of the posterior surface was right ventricular and three fifths left. There was a moderate amount of fat under the pericardium along the interventricular grooves and the auriculoventricular junctions, and at the base of the great vessels.

The pericardium was apparently normal.

The relationships of the heart chambers and of the great vessels were normal. The superior and inferior venae cavae appeared normal and the right auricle was normal in size and in the thickness of the wall. The foramen ovale was closed but there was a well marked depression in this region bulging into the left auricle. The coronary sinus was normal in position and size, with a partial valve at its ostium. A few chordae tendineae were found in the right auricle just above the tricuspid valve and at the right of the mouth of the coronary sinus.

The tricuspid valve was thickened, especially the left posterior cusp near the mouth of the conus and septal defect. There were no vegetations, but a markedly thickened ridge occurred along the free edge of the left posterior cusp with thickened chordae at this point. The circumference of the tricuspid valve was 10.5 cm.

The right ventricle was larger and thicker than the left. It showed little or no dilatation of its cavity and its wall varied in thickness from 2 cm. at its maximum to 0.5 cm. midway in the separate infundibular cavity. The muscle was firm and apparently normal. The septum between the infundibular cavity and the channel leading to the interventricular septal defect, composed of firm muscle, was 1 cm. thick (fig. 5). The papillary muscle of the right ventricle was located at the apex and was small, but a broad band of muscle 1.5 cm. in thickness extended up from the apex to form the muscle mass, which separated the infundibulum from the channel leading to the aorta (fig. 5).

At a point two thirds (4.5 cm.) of the distance from the apex of the right ventricular cavity to the pulmonary valve, there began a constriction which continued up to the valve (2.5 cm.). At the beginning this narrowed infundibular portion (fig. 5) consisted of a fish mouth opening, 1.3 cm. long and 3 mm. wide. This narrow path continued for 5 mm. and then widened into a chamber about 2 cm. long, 1.5 cm. wide and 5 mm. deep. It was lined, as was also the opening into it, with very firm fibrous tissue, densest at the beginning and at that point from 3 to 5 mm. thick, resembling closely the description by Fallot of his third case. There were a few openings into the infundibular cavity, about four or five, which extended into the body of the right ventricular muscle by capacious channels, probably representing thebesian vessels.

The pulmonary valve measured 5.5 cm. in circumference and was composed of two equal cusps, somewhat thickened but without vegetations. The pulmonary artery measured 6 cm. in circumference 1 cm. above the valve and was perfectly smooth. The ductus arteriosus was closed, but a small funnel-shaped depression extended about 3 mm. into it from the pulmonary artery. The aortic end of the ductus arteriosus was completely closed by a firm partly calcified disk, 1 cm. in circumference, flush with the aorta. The pulmonary artery continued normally to its two branches and showed little or no change in caliber. The right pulmonary artery at its mouth measured 1 cm. in diameter, and the left 1.3 cm. in diameter.

The channel leading to the aorta in the right ventricle (fig. 5) passed up on the other side of the thick muscular ridge, already described, from the infundibular stenosed opening at the same level. It extended for about 1 cm. until it reached the interventricular opening, that is, the top of the interventricular septal ridge; it was 5.5 cm. in circumference.

The left auricle was of normal size with a somewhat thickened wall, about 2 mm., which was considerably thicker near the junction with the right auricle, where it measured 5 mm. The pulmonary veins opened normally into it, three to the right and two to the left. The left auricle was small. There were no clots in either the left or the right auricle.

The mitral valve appeared normal except for some thickening along the margin and in the body of the anterior cusp. It was 8 cm. in circumference. There were no vegetations on it.

The left ventricle, making up less than half the heart in bulk, was nevertheless composed of firm normal muscle varying from 1.8 cm. in thickness in the region of the papillary muscles to 1 cm. at the apex. There was no dilatation of its cavity and there was no fibrosis. The papillary muscles were rather small but otherwise appeared normal.

At a point 5 cm. above the apex of the left ventricular cavity and 2 cm. below the aortic valve was the interventricular septal defect (fig. 5). The channel leading from the left ventricle toward the aorta at this septal defect was almost twice as capacious as that leading from the right ventricle. The septal defect was almost circular and measured 2 cm. in diameter. The septum at this point was 1 cm. in thickness, increasing somewhat below, half way to the apex. There was a fibrous ridge extending part way along this septal border and overlapping a little on the left ventricular side. The aortic cusp of the mitral valve faced the septal defect and at that point was considerably thickened and fibrosed.

The aorta was very capacious, and the aortic valve, with three very large cusps and extensive pockets behind them, measured 8.5 cm. in circumference. At a point 3 cm. above the insertions of the aortic valve, the aorta measured 9 cm. in circumference. The aortic cusps were normal except for a few fenestrations near their junctions.

The coronary arteries appeared normal except that there was a slight degree of sclerosis and puckering of the aortic intima at their mouths. They could be probed for several centimeters without difficulty and apparently were not calcified. The wall of the ascending aorta and aortic arch was smooth except for a few scattered areas of sclerosis without calcification, save at the closed end of the ductus arteriosus. The right subclavian and the right carotid arteries opened close together from the aortic arch. There was no coarctation of the aorta.

SUMMARY

We have reported here the case of a notable musician, Henry F. Gilbert, who for nearly sixty years of his life suffered from congenital heart disease with cyanosis and clubbing of the fingers. The case is of great interest, first, because with the tetralogy of Fallot (pulmonic or infundibular stenosis, interventricular septal defect, dextroposition of the aorta and hypertrophied right ventricle) he survived to his sixtieth year, surpassing in age all patients previously reported by more than twenty-three years, and secondly, and most significant, because he made of his crippled life a great success, establishing himself in his musical profession as one of the greatest of American composers and as a pioneer of native American music. We have recounted the history, accomplishments, physical examination, laboratory data and the conditions found post mortem in this remarkable man. The diagnosis of the cardiac defects was correctly made a year before his death. Fallot had demonstrated that this was possible forty years ago.

We trust that the account of this man's life may bring hope and inspiration to other victims of heart disease.

Massachusetts General Hospital.

TRICHINOSIS

REPORT OF TWO CASES PRESENTING DIPLOPIA AND ONE, POLYSEROSITIS *

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It is not surprising that trichinosis is incorrectly diagnosed when first seen in the majority of instances because it so closely simulates other much more common diseases. The mistake is particularly apt to occur in patients who develop the disease during the winter months when so-called grip is prevalent. The muscle pains, fever, profuse perspiration and prostration are very similar in the two diseases and, when headache is severe, an infection of the sinuses is often thought to be present. The edema about the eyes is sometimes erroneously attributed to the same cause. The presenting symptoms vary greatly. "Heaviness in the stomach," eructations, loss of appetite, nausea, sometimes associated with vomiting and at times accompanied by colic, especially nocturnal, and frequently diarrhea focus attention on the gastro-intestinal tract. Two of the patients admitted to the Hartford Hospital during recent years gave diarrhea as the outstanding complaint.

Fig. 1.—Section of deltoid muscle: I, inflammatory infiltration with cosinophils and lymphocytes; *C*, chitinous capsule forming; *T*, sections of coiled trichinella embryo; *M*, muscle fibers showing various stages of degeneration. The embryo and its capsule have destroyed and replaced portions of the muscle fibers.

During the first week or ten days, the so-called period of digression, edema of the eyelids may be present, though it is not, however, until later in the disease (after the third week) that the edema, especially of the head and eyes, attains its maximum. "Muscular rheumatism" is a common diagnosis because during the second week, when the muscle invasion is at its height, there are severe pains as a rule in the muscles, accompanied by tenderness and sometimes stiffness. The profuse sweats and fever further suggest some bacterial infection. When the diaphragm is involved, respiration may be very painful and pleurisy is closely simulated. The occurrence of severe asthma and dyspnea also focus attention to the respiratory system; the high fever that occasionally is present, associated as it often is with headache, loss of appetite, diarrhea and abdominal cramps, may easily suggest typhoid unless serologic and blood examinations are made. The group in which the

* From the Medical Service and the Hall-Wilson Laboratory of the Hartford Hospital.

neurologic symptoms predominate is especially interesting, and two of the cases here reported are of this type:

CASE 1.—B. D., a man, aged 21, admitted to the Hartford Hospital, March 12, 1928, because of pain in the eyes, had two days previously consulted Dr. F. L. Waite, who kindly supplied me with his notes. For the preceding ten days the patient had had a severe cold, though he did not feel "grippy" and was not confined to the house. This "cold" was not accompanied by a sore throat. Two days previously both the eyes and vision were normal but that evening the eyes began to swell and this swelling had increased. The patient used a mild silver preparation the night before consulting Dr. Waite and the next morning the lids were stuck together. March 10, while working, he discovered that his vision was blurred after a few moments of close work and he further noted that he saw double when he looked to either side. The vision of the eyes was normal (20/20); there was equal swelling of the orbital tissues, giving the eyes a moderate amount of proptosis. Inflammation was absent. With the vision directed straight ahead there was no diplopia with or without a red glass, but diplopia was present when the eyes were moved to the right or left or up or down. Movements of the eyeballs were normal except that on looking upward the left did not go as high as the right.

In the belief that the condition was probably the result of sinus infection, the patient was referred to Dr. William Dwyer,

Fig. 2.—Section of deltoid muscle: *M*, muscle fibers; *I*, inflammatory infiltration; *C*, chitinous capsule forming; *T*, site of coiled trichinella embryo. The parasite itself is absent.

who found redness and swelling of both midturbinates occluding the upper nasal space but no discharge. Dr. F. P. Clason next saw the patient and referred him to the hospital.

The most noteworthy thing in the examination was the extreme degree of edema of the ocular conjunctiva. This was ballooned up as though several cubic centimeters of fluid had been injected subconjunctivally. The pupils reacted to light and in accommodation. An accurate determination of the state of the ocular muscles was not made though the external recti appeared weak. The remainder of the examination was negative. As the patient had had a fever of from 102 to 104 F. for twelve days, it was assumed that he probably had a severe grippal infection and that the swelling of the conjunctiva was dependent on sinus disease, notwithstanding the fact that this could not be demonstrated. Spinal fluid examination revealed 92 lymphocytes: a careful search was made for trichinae but none were found.

The clue to the condition was the discovery of an eosinophilia of 28 per cent. It is surprising that the patient had almost no muscle pains during his sojourn in the hospital and that they were very slight even before. Only on questioning did he confess to some stiffness of the neck. Accordingly a small piece of deltoid muscle was removed for microscopic examination, and trichinae were found (figs. 1 and 2).

CASE 2.—M. S., a youth, aged 20, a chum of patient 1, entered the hospital, March 19, 1928, because of weakness of two weeks' duration and slight general "achiness." The ocular conjunctivae had been swollen and reddened and he experienced diplopia when he looked sideways. On admission to the hospital he no longer saw double and was not having any muscle pains. He had never had severe pains in the muscles and there was no tenderness. Except for slight puffiness about the eyes, the examination was essentially negative. Spinal fluid examination showed 90 lymphocytes; it was negative for trichinae. Trichinae were found in a piece of the trapezius muscle.

An unsuccessful attempt was made to trace the source. Both patients ate pork from time to time but did not like it rare. In only one instance did they eat sausage away from home. These sausages were traced but it hardly seemed likely that this was the source because the method of curing and preparation seemed satisfactory. The mother of patient 2 had some mild indisposition at about this time and her blood was examined by her physician, who did not find an eosinophilia.

The importance of a differential blood count is clearly shown in these cases because the occurrence of headache, fever and diplopia together with a spinal fluid lymphocytosis that may be as high as 200 per cubic centimeter might easily lead to a diagnosis of encephalitis. Cases have been reported in which there was distinct evidence of meningeal irritation. Insomnia sometimes occurs; in other instances somnolence, delirium, formication, fixation of the eyes, stiffness of the neck, ankle clonus, positive Babinski reflexes, and absent or increased knee jerks have all been noted.

CASE 3.—E. Y. S., a man, aged 53, was operated on in the Hartford Hospital for inguinal hernia, Nov. 14, 1928, and discharged after three weeks. He was readmitted three days later complaining of very severe pain in the left chest. He first noted slight pain just before leaving the hospital, in the region of the left apex and at the left costal border. This became much worse the day before readmission. The physical signs were thought to be indicative of a beginning pneumonia at the left base. The next day a well marked pleural friction was present over the left lower lobe: ten days later a similar rub appeared at the right base. One week after readmission a sharp pain was complained of across the thorax in front, and on the following day a pericardial friction was evident.

Effusion took place in each pleural cavity and 600 cc. of blood-tinged, amber fluid was removed from the right sac. Great was our surprise to find 85 per cent eosinophils in the sediment. Several days later about 100 cc. of similar appearing fluid was removed from the left chest; this also showed a high eosinophil count, 61 per cent. Culture of the chest fluid was sterile and careful search did not reveal trichinae. As no appreciable amount of fluid was found in the pericardium, this was not tapped.

Leukocytes on admission numbered 19,200; five days later, 12,700. One blood smear gave 31 per cent eosinophils, another 21 per cent.

The patient had always been fond of pork though he did not recall ever eating underdone meat, but he thought he had eaten some that "wasn't very good" about six weeks before. Eighteen or nineteen years ago, he was seized during the night with what he termed "rheumatism"—extreme pain in the legs and thighs that "doubled him up." He was living on the third floor of a rooming-house at this time and the next morning, with great difficulty, he went down two flights of stairs to phone a Christian science healer, taking three quarters of an hour to make the trip downstairs and back again to his room, so severe was the pain. The pain lasted several weeks with lessening severity but he recalled some months later that they recurred with such severity while acting as usher at a Christian science meeting that after the lecture started he had to lie down on the floor. He did not observe swelling about the eyes.

Ten years later—nine years ago—while in India, he had some illness accompanied by vomiting and diarrhea for a week or so, the nature of which was not known; later he had two attacks of malaria. He also visited Japan and China.

There were several rather unusual features about this case. Notwithstanding the extensive bilateral pleurisy and bronchopneumonia, together with pericarditis, he had little fever after the first twenty-four hours and never seemed very ill. The pleural fluid was sterile; stool examinations were negative. A piece of the trapezius was examined for trichinae but none were found. The muscle was not taken from the leg, as the history of the leg pains was not obtained until after the section was made.

Dr. George W. Bachman of the Johns Hopkins University School of Hygiene and Public Health kindly made a precipitation test on the blood serum and obtained a positive result in 1:4,000, which is a very strong reaction. He also obtained strongly positive tests on the serums from patients 1 and 2 ten months after recovery.

It would seem that the history of severe pains in the legs, and the presence of an eosinophilia in the blood and pleural effusion together with the strong precipitation test, establishes the diagnosis of trichiniasis with reasonable certainty, even though trichinae were not obtained in the muscle excised. If the infection took place eighteen years ago, as the history suggests, it is of interest that the blood serum still gives a very strong reaction. Osler [1] mentions that trichinae may live as long as twenty or thirty years after entrance into the system. Reinfection may occur and it is possible that this patient ate infected pork five or six weeks before the onset of symptoms.

The initial pain in the left side of the neck and at the costal border is typical of diaphragmatic pleurisy, which might have been incited by the presence of trichinae in the diaphragm.

Opie [2] ascertained that bacteria exert a chemotactic influence on eosinophils, though they rarely appear to act as phagocytes. They are sometimes found in the effusion of tuberculous pleuritis, though not in such numbers as in this case. A temporary eosinophilia occurs during a positive tuberculin reaction. In trichiniasis they are most numerous in the blood toward the end of the third or early in the fourth week after infection, when the larvae are entering the muscle in largest numbers.

Askanazy,[3] who studied experimental trichiniasis, found that the trichinae reach the muscle by way of the lymphatics, thoracic duct and blood. The lungs are heavily infested, he having repeatedly found embryonic trichinae, which he believes act as emboli and cause the lesions in the muscles.

When the larvae are passing through the mesenteric lymph glands there is a local accumulation of eosinophils at the base of the mesentery of such marked degree that they resemble small abscesses.[4] Only in the lungs does the accumulation of eosinophils approach that of the mesenteric lymph glands. In two of Opie's experiments the lungs contained small nodules of consolidated tissue in which eosinophils were massed in great numbers.

In the center of the nodules, eosinophil cells were so numerous that with eosin stain the tissues had an almost homogeneously red color. He did not find trichinae in these lesions, however.

1. Osler, William: Principles and Practice of Medicine, ed. 8, 1912, p. 296.
2. Opie, E. L.: Am. J. M. Sc. **127**: 988, 1904.
3. Askanazy: Virchows Arch. f. path. Anat. **140**: 42, 1895 (quoted by Opie, footnote 4).
4. Opie, E. L.: Am. J. M. Sc. **127**: 477, 1904.

In view of the foregoing, the finding of 85 per cent of eosinophils in the pleural fluid would favor trichiniasis, even though trichinae were not found.

The possibility that there may have also been some bacterial infection cannot be denied. The failure to demonstrate any organism either by culture or by smear is against the assumption but does not exclude it. McDonald and Waddell,[5] whose recent fatal case of trichiniasis presented clinically and at postmortem a lobar pneumonia (type 4) state that "just what relation the lobar pneumonia had to the trichiniasis is not evident."

Minot and Rachemann [6] reviewed 102 cases of trichiniasis several years ago and found that in 50 per cent there were physical signs, symptoms or both, referable to the lungs. In 9 per cent the signs and symptoms were sufficiently obtrusive to mask the underlying condition. No mention was made of a pleural friction and in no case was thoracentesis performed.

If the patient is seen very early, the diagnosis may be made by finding the trichinae in the blood or by stool examination. Eosinophilia is not present at this time. Some very severe cases have been reported in which the eosinophilia failed to develop during the period of observation, or if they have been preserved they nearly disappear before death; they also disappear from the bone marrow. Dr. Bachman [7] has recently reported his results with intradermal injections of trichinella protein in early experimental trichinosis. The test was negative in noninfected rabbits but positive in those infected by trichinosis. A positive test was obtained as early as the second day after the eating of trichina-infested meat.

Dr. Bachman [8] has also developed a precipitation test that becomes positive from about the twentieth to the thirtieth day after infection. The results with this test on these patients has already been referred to.

It is believed that the toxic symptoms are due to the absorption of the large amount of destroyed muscle that results from the invasion of trichinae rather than from the parasite itself. When one notes how much muscle injury occurs, as shown in the accompanying photomicrographs, from one of these patients, and then speculates on how many thousand such areas there are in the body, one marvels that there is sometimes so little muscle pain and that recovery is so complete.

Professional Building.

5. McDonald, E. P., and Waddell, K. C.: An Epidemic of Trichinosis, J. A. M. A. **92**: 449 (Feb. 9) 1929.
6. Minot, G. R., and Rachemann, F. M.: Am. J. M. Sc. **150**: 571 (Oct.) 1915.
7. Bachman, G. W.: J. Prev. Med. **2**: 35 (Jan.) 1928.
8. Bachman, G. W.: J. Prev. Med. **2**: 513 (Nov.) 1928.

Backache a Symptom.—Backache, like headache, fever and blood pressure, is a symptom and may require considerable investigation on the part of the physician before its cause is ascertained. All of us realize that there are a large number of causes. Fortunately other symptoms are commonly associated with backache which make it appear at once only incidental to the condition. We should always think of backache in this manner. As one limits his practice, the importance of his specialty is likely to dominate the etiology; thus at one time the gynecologist believed most backaches were due to pelvic disorders, the urologist that most were due to kidney diseases, the orthopedists held that they saw a lot of backache from strains, osteal conditions and malformations of the spine, and we in medicine are sure that most are due to infectious states. No doubt we are all correct, as each sees that which he specializes in and finds backache associated with it.—Lambright, G. L.: Etiology of Backache in Medical Practice, *Ann. Int. Med.*, February, 1929.

THE BLIND SPOTS IN PATIENTS WITH INTRACRANIAL TUMORS *

LOYAL DAVIS, M.D.
CHICAGO

As the result of a preoperative and postoperative study of a series of intracranial tumors, I was impressed with my own difficulty in accurately measuring the degree of papilledema by ophthalmoscopic examination. That this difficulty was not altogether confined to my limitations in ophthalmologic training was emphasized

Fig. 1.—Cross-section of normal optic nerve head: The retina is closely applied to the edges of the nerve.

by the discrepancies in the measurements of diopters of swelling made by competent ophthalmologists on the same patients. Therefore, at the suggestion of Dr. Brown Pusey, I undertook first to study the graphs of the blind spots of patients with intracranial tumors taken before and after operation and, secondly, to determine if possible the actual mechanism involved in the enlargement of the blind spots due to an increase in intracranial pressure.

In 1668, Mariotte [1] described the simple, perhaps crude, but wholly satisfactory experiment which demonstrated the existence of the blind spot:

> I fastened on an obscure wall, about the height of my eye, a small round paper, to serve me for a fixt point of vision; and I fastened such another on the side thereof towards my right hand, at the distance of about two feet; but somewhat lower than the first, to the end that it might strike the optick nerve of my right eye while I kept my left shut. Then I placed myself over against the first paper and drew back little by little, keeping my right eye fixt and very steady upon the same, and being about ten feet distant the second paper totally disappeared.

This experiment resulted in a controversy between Mariotte and Pecquet concerning the rôle of the retina and the choroid as the principal organ of vision. The latter argued that only the areas at the entrance of the retinal artery and vein are blind. Mariotte believed that the optic nerve is insensible to light over its entire extent.

Seemingly, two hundred years elapsed before Mariotte's fundamental experiment was utilized as a practical contribution to ophthalmology. In 1870, Herman Knapp,[2] who seemed to be the spirit of the American Ophthalmological Society, attempted an explanation for the enlargement of the blind spot:

> Enlargement of Mariotte's blind spot can only be explained thus: exudation (fluid and white blood corpuscles) travels from the arachnoidal cavity into the intervaginal space, oozes through the periphery of the lamina cribrosa and expands into the soft tissues around the margin of the optic disk, the suprachoroid, choroid proper and retina. The optic nerves of the latter, situated farthest from the origin of exudation, will be attacked least and last. The rods and cones, however, the peripient layer of the retina, will be affected sooner and have their function either destroyed or kept in abeyance. The rods and cones are more easily destroyed than the nervous fibers. . . . If the exudation passed through the optic nerve itself, there would be a like pressure on all the nervous fibers and an equal diminution of visual acuteness over the entire field.

In spite of Knapp's clear statement of the case, a theory first conceived by von Jaeger in 1855 has received rather general acceptance. This set forth that medullated nerve fibers originating from, or adjacent to, the optic disk are projected into the visual field as an enlargement of the blind spot. Virchow, among others, showed that the retina underlying these medullated nerve fibers is normal in respect to the light-perceiving elements and corresponds anatomically to the functioning retina elsewhere; but, as was shown by Gradle,[3] the rather rare occurrence of medullated nerve fibers in the retina (0.4 per cent) decreases the frequency with which this fact will explain enlargement of the blind spot.

An important aid to the understanding of what happens within the eye in which the blind spot has been enlarged as the result of an increase in intracranial pressure is a consideration of the pathogenesis and pathology of papilledema. Experimental corroboration of the mechanical theory of the production of papilledema by a rise in intracranial pressure has been supplied by Parker [4] and others. By introducing powdered agar in a capsule into the brains of animals, I have been able to produce a gradual rise in the intracranial pressure and papilledema which closely simulates that caused by an intracranial tumor. From studies of the pathology of papilledema, Paton and Holmes [5] concluded that the

Fig. 2.—Cross-section of optic nerve which is swollen as the result of an increase in intracranial pressure: The retina is pushed laterally.

* From the Department of Surgery, Division of Neurologic Surgery, Northwestern University Medical School.

* Read before the joint meeting of the Section on Ophthalmology and the Section on Nervous and Mental Diseases at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 14, 1928.

1. Mariotte: A New Discovery Touching Vision, Phil. Tr., 1668.

2. Knapp, Herman: The Channel by Which, in Cases of Neuroretinitis, the Exudation Proceeds from the Brain into the Eye, Tr. Am. Ophth. Soc., 1870, p. 119.

3. Gradle, H. S.: The Blind Spot: III. Relation of Blind Spot to Medullated Nerve Fibers in the Retina, J. A. M. A. **77**: 1483 (Nov. 5) 1921.

4. Parker, W. R.: Choked Disk, J. A. M. A. **67**: 1053 (Oct. 7) 1916.

5. Paton, L., and Holmes, G.: The Pathology of Papilledema, Brain **33**: 389, 1911.

swelling of the disk is due almost entirely to infiltration of its tissues and the anterior layers of the lamina cribrosa with fluid. As the disk swells it displaces the retina laterally and often throws it up into small folds (figs. 1 and 2). As the swelling increases, the course of the nerve fibers becomes disturbed and some of the peripheral fibers take on a somewhat acute S-shaped curve. The physiologic cup becomes filled with axial fibers and edematous fluid beneath the internal limiting membrane. In some cases of papilledema the physiologic cup may remain clear and there may be a difference of 6 or 7 diopters between the level of the disk in that portion and the highest point of swelling. On the other hand, the physiologic pit may be obliterated and the difference between that portion of the disk and the highest point of swelling may be only 3 or 4 diopters. In both instances, however, the retina has been displaced laterad an equal distance, and the enlargement of the blind spot is equally great.

There is, of course, abundant clinical confirmation of this theory of pathogenesis. Intracranial tumors that press directly on the nerve at the optic foramen shut off the subarachnoid space of the nerve from the general cerebral subarachnoid space. Thus the retinal vessels are protected from the rise in intracranial pressure and the outflow of blood and lymph from the eye is little affected. Examples of such neoplasms are pituitary tumors and tumors of the frontal lobe which cause primary atrophy in one optic nerve by direct pressure and papilledema in the other eye.

The essential feature of the pathologic picture thus produced within the eye is displacement of the layer of rods and cones from the edges of the nerve papilla. This fact may be verified easily by the examination of a human eyeball in which papilledema has existed. It is corroborated also by animal experiments. That atrophy of the rods and cones near the nerve papilla may occur as the result of pressure from the swollen nerve head cannot be denied, but in the examination of their material Paton and Holmes did not observe prominent degenerative changes in the retina during the acute stages of papilledema and did not find any evidence whatever of degeneration in the rods and cones. Apart from the folding and displacement, edema produces little change in the other layers of the retina.

There are causes for enlargement of the blind spots other than papilledema, and some of these come within the range of normal variations. Coloboma of the disk and opaque nerve fibers are examples of congenital conditions associated with an enlarged blind spot. In myopia, the anteroposterior diameter of the eye is increased, and enlargement of the blind spot is the result of separation and consequent atrophy of the tunics of the eye. Lillie [6] has shown that, in involvement of the optic tracts near the chiasm by the direct pressure of a tumor without the production of papilledema, enlargement of the blind spots is the earliest change found. This may be true even when the visual fields to form and color are normal. Evans [7] has shown that the larger retinal vessels may produce radial enlargements of the blind spots.

To the neurologic surgeon the methods of measuring and recording the blind spots have increased in the intricacy of the apparatus used and the complexity of the technic of examination since Mariotte's simple experiment. This is the result, no doubt, of attempts to exhaust the scientific possibilities of the blind spot. It has been measured in its vertical and horizontal diameters; various shapes have been drawn to represent a norm; black test objects have been used on a white background and vice versa; the test object has been moved from the blind to the seeing area and from the seeing to the blind area; and various screens and apparatus for illumination and stereoscopic fixation have been employed. While all of these stages in the investigation of the blind spot have been of value, they have served nevertheless to make the practical use of the blind spot as a diagnostic and prognostic aid somewhat onerous.

It would seem that a simple, accurate method of plotting the blind spots might offer many practical advantages to the neurologic surgeon in a study of the results of his surgical therapy.

A few points must be kept in mind and used during the plotting of a blind spot. The patient's head should

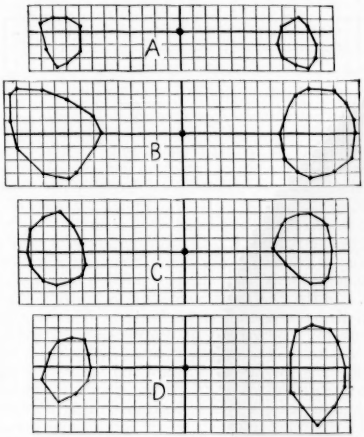

Fig. 3.—Blind spots of patients without an intracranial lesion: *A*, from a patient with normal refraction; *B*, from a patient with myopia; *C*, from a patient with normal refraction; *D*, from a patient with an astigmatism in the right eye.

be placed at a given distance from the point of fixation and held there. I have always used a distance of 36 inches. A blackboard ruled into inch squares and with a central fixation point may serve as a screen. Square white test objects of varying sizes held on a long black rod may be moved from the blind into the seeing field. It is very easy to show the change in size of the spot if the object is moved from the seeing to the blind area. Artificial, and therefore constant, illumination should be used. By observing these simple procedures I have been able to make use of the blind spot records as an accurate method of following the increase or decrease in the papilledema produced by a rise in intracranial pressure due to intracranial tumors.

MATERIAL

The material on which this study is based consists of 105 intracranial tumors. Of these, seventy-two were verified by microscopic sections. The remainder were known to be tumors but were unverified for one reason or another. In addition, the blind spots of fifty normal

6. Lillie, W. I.: Ocular Phenomena Produced by Intracranial Lesions Involving Optic Tracts Near the Chiasm, J. A. M. A. **81**: 1765 (Nov. 24) 1923.
7. Evans, J. N.: Angioscotometry, Am. J. Ophth. **9**: 489 (July) 1926.

persons were plotted. Some of the latter had refractive errors, such as myopia and astigmatism, which aided in establishing the size and shape of an average normal blind spot. Examples of these blind spots are shown in figure 3. While the blind spot may differ considerably in shape among a group of normal persons, one may easily obtain a knowledge of the limits of the normal spot and as a result slight variations are readily detected.

In the cases of tumor, the blind spots were charted and replotted several times prior to the operation before a photograph was made for the hospital records. In

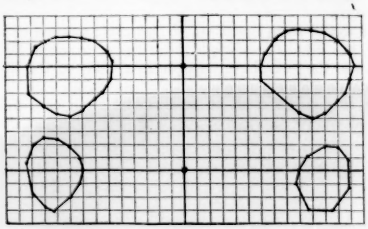

Fig. 4.—Blind spots of a patient with an intracranial tumor (meningioma) which was removed. Above are the spots charted, June 20, 1927; below, those plotted, October 29, after removal of the tumor.

each instance, including those cases of pituitary tumor without the presence of increased intracranial pressure, the blind spots were definitely enlarged above those of a group of normal persons. In all but five of the patients, the tumor was attacked by a surgical procedure designed to remove it. In those instances in which an attempt at removal of the tumor was surgically unwise, a decompression was effected through the operative field. In the five cases mentioned, a primary subtemporal decompression was performed. This was done because the observations of ventriculography indicated that the tumor was surgically unapproachable.

Following the operation, the blind spots were again plotted several times before the patient left the hospital, and in every case a definite decrease in size proportionate to the relief from increased intracranial pressure was found. This procedure continues to be an important part of the follow-up examination of our patients. As a result, a complete photographic record of the course of progression and regression in the size of blind spots is a part of each patient's chart.

Figure 4 reproduces the blind spots of a patient from whom a meningioma was removed from the left cerebral hemisphere. The tumor was attached to the dura mater and had its origin from the falx cerebri. To remove it completely it was necessary to resect a portion of the falx cerebri and the superior longitudinal sinus. The blind spots of this patient before operation, June 20, 1927, are shown in the upper half of the chart. The ophthalmoscopic readings of the height of papilledema at that time made by three observers were 4, 5½ and 3 diopters. October 29, the blind spots were as shown in the lower half of the chart, and they have remained at this size since that time. At present no swelling can be measured by ophthalmoscopic examination.

Figure 5 shows the blind spots of a patient with an intracranial glioma which was partially removed from the right frontal lobe. A decompression opening was made at the base of the osteoplastic flap. The decrease in the size of the blind spots from Nov. 13, 1927, to Jan. 15, 1928, is apparent from a comparison of the upper and lower graphs. In this patient the ophthalmoscopic estimations of the diopters of the swelling ranged from 3 to 7 before operation.

In figure 6 are represented the blind spots of a patient with an unlocalizable intracranial tumor before and after a right subtemporal decompression. The prompt decrease in the size of these blind spots from Dec. 5 to Dec. 16, 1927, would seem to offer undoubted evidence of the value of a simple decompression to the patient's vision.

COMMENT

Such graphs of the blind spots are an old story to the ophthalmologist, but the opportunities are not commonly present for him to follow the postoperative recession of the size of the blind spot. That such a method of observing and recording the subsidence of papilledema is far superior to the ophthalmoscopic measurement of diopters of swelling in a disk seems obvious. The rather wide diversity of the measurements of the height of papilledema in the same patient made by several ophthalmologists testifies to the inaccuracy of such a method of record. This difficulty increases as the papilledema subsides. If ophthalmoscopic measurements of the degree of papilledema are to be of real service they must be made with great care and with certain precautions. Moore [8] believes that valuable observations may be obtained only by making a diagram of a disk and vessels, noting the particular area on the vessels which is employed, and then utilizing the same spot at the next examination.

It may be argued that in the charting of blind spots the patient's inability to concentrate is a source of error. The same source of error is present in the perimetric charting of visual fields, yet several examiners may repeatedly obtain identical fields in the same individual without great difficulty. When it is realized that the optic nerve head is 1.8 mm. in diameter and is magnified when projected 36 inches, it is apparent that the chance of error in the recording of the size and shape of the blind spot is greatly reduced. Simplification of the

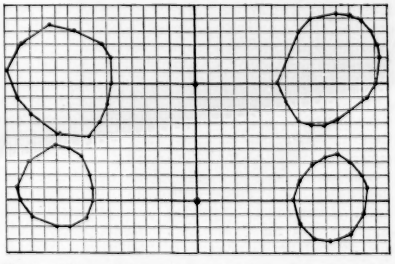

Fig. 5.—Blind spots of a patient with an intracranial tumor (glioma) which was partially removed. The blind spots above were taken, Nov. 13, 1927, and those below, Jan. 15, 1928, after operation.

method of obtaining a graph of the blind spots also lessens the likelihood of error and adds to the practicability of the procedure. Because of these facts, the records of several examiners may be used indiscriminately.

In the past, the value of the effect of decompressive operations on papilledema has been challenged. Unfortunately, the evidence of records of decrease in diopters of swelling made by different examiners has been such

8. Moore, R. F.: Medical Ophthalmology, ed. 2, Philadelphia, P. Blakiston's Son & Co., 1925.

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that the neurologic surgeon has been unable to convince the skeptics. In all of the patients of my series, plots of the blind spots will show conclusively the beneficial effect of the surgical procedure whether it was an attempt at removal of the tumor or simply a palliative decompressive operation.

It seems obvious that the explanation for the increase in the size of the blind spot in the presence of increased intracranial pressure resides in the demonstrable fact that the layer of rods and cones is pushed aside by the edematous nerve head. This can be shown both clinically and experimentally. It also seems entirely logical that the decrease in the size of the blind spot follows the subsidence of edema and the return of this layer of the retina to its normal position. Paton and Holmes have shown microscopic evidence of this fact.

CONCLUSIONS

1. In enlargement of the blind spots due to increased intracranial pressure, the layer of rods and cones is pushed laterally by the edematous optic nerve papilla.

2. The blind spots of patients with intracranial tumors may be recorded accurately and simply before and after operation.

3. Records of the size of the blind spot are of greater value in determining and following the increase or decrease in papilledema than are ophthalmoscopic measurements of the height of swelling of the optic nerve heads.

ABSTRACT OF DISCUSSION

DR. W. I. LILLIE, Rochester, Minn.: The mechanism which produces a choked disk is still a moot question. The author's experimental work and that of Shieck and Parker tend to prove the theory of mechanical obstruction, but Behr stresses the damming back of the cranially directed lymph flow through the optic nerve as the factor producing choked disk. The enlargement of the blind spot due to a choked disk has been shown by Paton and Holmes to result from lateral displacement of the rods and cones from the margin of the disk. Admitting this, the following question arises: How much choking of the disk is necessary to produce lateral displacement of the rods and cones, and to cause enlargement of the blind spot? It has been my experience in observing a large number of cases of choked disk that the character and not the amount of the edema of the disk is important in the production of the enlarged blind spot. One may roughly divide choked disks into two main types: a cone shaped swelling, in which the height is not much greater than the lateral infiltration of edema into the surrounding retina, and the mushroom shaped swelling, in which the height is much greater than the almost absent lateral infiltration of edema into the surrounding retina. Obviously, the enlargement of the blind spot will be greater in a low cone shaped choked disk than in a relatively higher mushroom shaped choked disk. This, clinically, is true, and agrees with the pathologic change of the known lateral displacement of the rods and cones produced by choked disks, as shown by Paton and Holmes. Necessarily, then, a careful ophthalmoscopic examination to determine the type of choked disk present is very essential and combined with an accurate plot of the blind spot, a descriptive and graphic record of the choked disk is obtained. The height of a mushroom shaped choked disk may rise or fall without further measurable change in the enlarged blind spot. Certain complications may arise, such as a subhyaloid hemorrhage around the disk, partial venous thrombosis, or beginning secondary optic atrophy, which will produce a greater enlargement of the blind spot without increasing the choked disk. In any one of these three common complications, the interpretation of the progressive enlargement of the blind spot would be faulty without a careful ophthalmoscopic examination. The ophthalmoscopic examination is the only method available which can be used with accuracy in all cases, regardless of the mental or physical condition of the patient.

DR. ALLEN GREENWOOD, Boston: It seems to me that many of the ophthalmologists of the present day have not had the training in measuring errors of refraction with the ophthalmoscope which was customary at the time Dr. Weeks was busy teaching and practicing ophthalmology. It is possible for a man to train himself so that he can measure errors of refraction with quite considerable accuracy with the ophthalmoscope, and thus be able to measure the elevation of the disk with considerable accuracy. That does not mean that I do not agree with the author that his method is probably superior, but I feel that the neurologist who takes up the use of the ophthalmoscope should also acquire the ability to measure errors of refraction with the ophthalmoscope. I remember a case in which a neurologist advised a brain surgeon to operate in a case of injury, stating that there were 4 diopters of elevation of the disk in each eye. I was asked by the surgeon to see the patient before operation. The man had 5 diopters of hypermetropia with a practically flat disk.

DR. EVERETT L. GOAR, Houston, Texas: For several years I have been interested in a study of the blind spots and have plotted them in all suspected cases of optic nerve involvement, whether caused by papilledema, optic neuritis, glaucoma, toxic amblyopia or any of the other diseases that affect the optic nerve. It is unquestionably one of the most valuable means of functional testing at our command. In the series of patients tested there have been a number of brain tumors. Those with choked disk invariably have had an enlargement of the blind

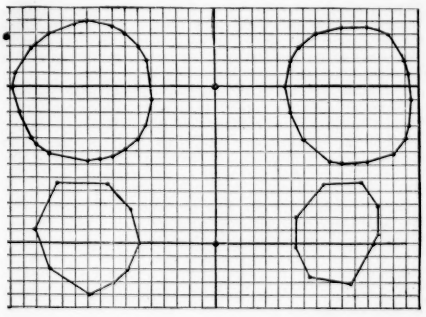


Fig. 6.—Blind spots of a patient with an increased intracranial pressure and a papilledema. The blind spots above were taken, Dec. 5, 1927, and those below, December 16, after a right subtemporal decompression operation.

spots, though often to a lesser degree than might be expected from the ophthalmoscopic appearance. I have attributed this to pressure on the peripapillary fibers of the optic nerve which Fuchs demonstrated are connected with the rods and cones immediately surrounding the disk. It is quite probable that this, as well as the reason given by the author, is a factor in the extension of the blind spots. Of much greater value than the observations of blind spots in these cases are the visual field changes that may be demonstrated on the tangent screen. Hemianopias, sector defects, scotomas of various types and other central field changes may be plotted with more precision and much more quickly than with the arc perimeter. I have seldom had the opportunity to follow up patients with papilledema after operation for brain tumor. Few of these patients return to the ophthalmologist for examination. It is certainly true that measuring the elevation of a choked disk by the ophthalmoscope is a difficult task and the opinions of equally competent ophthalmoscopists are subject to wide variation. I cannot recall ever having seen a well marked papilledema in which the vascular funnel was not obliterated, though this might occur in persons having large physiologic excavations. I have frequently been amazed at the persistence of normal central visual acuity in the presence of pronounced choked disk. I can recall a patient of this sort who had normal visual

acuity and very moderate enlargement of the blind spots over a period of several weeks' observation, during which time the neurologists and otologists were attempting to localize the tumor. Operation revealed a very large infiltrating glioma involving both frontal lobes. Dr. Davis has described a method of following up the regression or enhancement of intracranial pressure that should be of more value than any we have previously had at our command.

DR. HARRY S. GRADLE, Chicago: With appreciation of Dr. Davis' work and the results obtained, I have some doubts as to the extension of the enlargement of the blind spot in cases of brain tumor. I do not question the results obtained by the measurements, or the value derived as to the retrogression or advance of the blind spot, but what is the mechanism that causes the enlargement of the blind spot in these cases? There are three possible causes, one of which he has mentioned. The second, which is the edema within the intravaginal sheath of the optic nerve within the optic canal, Dr. Goar has touched on. In the course of the optic nerves, the fibers from the retina immediately around the disk lie in the extreme periphery of the optic nerve practically in the form of a ring. As the nerve passes through the optic canal there is only a very small space between the periphery of the optic nerve and the dural periosteum which lines the optic canal. Within the canal the dura and periosteum come from one membrane and are not separated. Any increase of pressure within the dura would press primarily on the fibers that lie in the periphery of the optic nerve, and these are the fibers immediately around the optic disk. Interference with their function would cause enlargement of the blind spot and it seems rather probable to me that the enlargement of the blind spot is dependent more on the pressure within the optic canal than on the recession of rods and cones around the nerve within the eyeball. The third possible explanation is a localizing toxemia. There is a stasis occurring in the nerve head that causes the papilledema, and such stasis is accompanied within a comparatively short time by the formation of toxins. It is possible that these toxins are causing paralysis on the nerve fibers around the optic nerve head. As suggestions to Dr. Davis in continuing this study: Photography of the optic nerve head, preferably stereophotography, is of value, some point on the nerve head being utilized as the site for using the ophthalmoscope. One can measure the elevation of the optic nerve head with fair accuracy with a little practice. Blind spots can be measured with greater accuracy than heretofore by using the method described by Evans in his article on Angioscotometry. With these accurate measurements I believe still further information as to the source of the enlargement of the blind spot could be obtained.

DR. LOYAL E. DAVIS, Chicago: This is not my method. It is simply a method which I have tried to use because I have been unable to use any more difficult method for examining the blind spot. I think that Dr. Greenwood has illustrated my position in regard to examination of the blind spot as well as I could have done it. This, then, is simply a method that I have found useful and if it is accurate, and I think that Dr. Gradle should know, then it is what I have been looking for.

The Eye as Indicator.—In reflecting upon the eye in its relation to internal medicine and diagnosis, one is surprised that so little emphasis has been laid on this organ. From time immemorial health, beauty and character have been estimated from the eye. The trained physician receives first and best impressions from posture, respiration, color and the eye. Routine examination of lids, conjunctiva, ocular muscles, tension and pupils may quickly lead investigation into channels of correct diagnosis and to economy of time and money for the patient. For example, one does not enter lightly on a diagnosis of pernicious anemia in a brown-eyed patient, icteric scleras are observed before the abdomen of the dyspeptic patient is examined, conjunctival petechiae lead one away from the lungs and to the heart of the feverish young man, long cures for rheumatism are omitted when Argyll Robertson pupils are found, and the unconscious patient with soft eyeballs is treated an hour or two earlier for diabetic coma than if this finding had not been made.—MacDonald, J. A.: The Eye in Its Relation to Medical Diagnosis, *J. Indiana M. A.*, February, 1929.

Clinical Notes, Suggestions and New Instruments

A CASE OF DERMAL MYIASIS CAUSED BY PHORMIA REGINA MEIG. *

M. A. STEWART, M.S., HOUSTON, TEXAS

The case described in this paper seems to us to be of interest for three reasons: first, accurate and detailed records of myiasis produced by the larvae of *Phormia regina* Meig. are very rare; second, the entire clinical history of the patient is known, and, third, the fact that dermal myiasis is widespread throughout the country and may occur whenever there is the least opportunity for it to do so is well emphasized here.

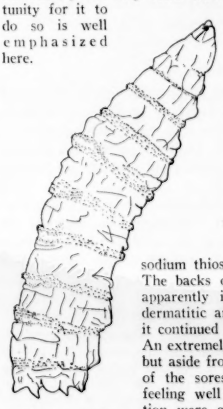


Fig. 1. — Larva of Phormia regina Meig.

REPORT OF CASE

A negress, aged 25, a prostitute, admitted to the unclean ward of the hospital, with a 4+ Wassermann reaction, for treatment of a scalp infection, presented scalp sores, with a heavy pus exudate, and dermatitis on the upper and outer lobes of the ears and on the mastoid area. This condition was due to an overdose of arsphenamine and was being treated by injections of sodium thiosulphate given intramuscularly. The backs of the lobes of the ears were apparently in a healthy condition. The dermatitic area was not large at first but it continued to spread after hospitalization. An extremely offensive odor was given off, but aside from the dermatitis and irritation of the sores, the patient appeared to be feeling well; appetite, digestion and egestion were good. At first treatment was applied only to the area around the ears, but on the night of the patient's admission to the hospital the discovery was made that the scalp was a mass of pus and a supersaturated sulphur wash was applied. The hair was parted to allow the wash to penetrate freely to the scalp and a towel was tied about the head, coming below the ears. The supersaturated sulphur wash was applied every two hours.

After the second treatment was applied to the scalp the patient became very restless, working the fingers into the palms of her hands and alternately putting her hands to her ears. Soon she began to scream, acted frantic, and became nearly delirious. She was given a sedative without effect.

On taking the towel from the patient's head the nurse observed fly larvae, which had been forced into activity by the treatment, crawling over the towel, hair and down the cheeks. The nurse estimates that she killed twenty-five or thirty larvae in the hour and a half she spent in removing them and still the hair and scalp remained full of them. Back of the ears the mass of living larvae was so great that they could almost have been spooned out. At this time the patient complained of a buzzing in the ears similar to that occurring when the ears are full of water, and said that she could not hear. The nurse then used toothpick swabs to remove the great quantity of larvae found in the pinnae of the ears; in so doing most of the larvae were killed, but some where kept alive and placed on raw beef in vials so that they might complete their larval growth and pupate.

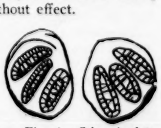


Fig. 2.—Stigmal plates of Phormia regina.

* From the Rice Institute.

* The author is indebted to Dr. George A. Dix, dermatologist, Worcester City Hospital, Worcester, Mass., for the facts concerning the case described in this paper.

As soon as pupation occurred the puparia were removed to fresh vials and covered with fine dry soil until they emerged as adults, when they were identified as *Phormia regina*.

After the removal of all visible larvae had been completed the patient's hair was clipped, the supersaturated sulphur wash treatment was continued, and the scalp was bandaged. To the original area of dermatitis around the ears was applied a paste consisting of salicylic acid, 2 Gm.; zinc oxide, 24 Gm.; starch, 24 Gm.; petrolatum, sufficient to make 100 Gm.

It is obvious that an adult female fly had been attracted to the suppurating scalp sores by the foul odor given off and had oviposited in one or more of these sores. The larvae were driven from the scalp to the pinnae of the ears by the application of the supersaturated sulphur wash.

COMMENT

Phormia regina Meig. (the queen blow fly or the black blow fly) is known under the following synonyms: *Euphormia regina, Lucilia infuscata, Musca regina, Phormia philadelphica, Phormia fulvifacies, Lucilia terraenovae, Lucilia rufipalpis* and *Lucilia stigmaticalis*. The adult female oviposits from seven to eighteen days after its emergence and the eggs hatch in from twelve hours to four days, depending on the temperature. The first larval stage lasts about three days; the second larval stage two or three days, and the third larval stage, during which active feeding is carried on, about three days. Pupation takes place three days later and the pupal period extends from three to thirteen days. This fly hibernates in the immature stages.

The larva of *Phormia regina* is yellowish white and of a somewhat wrinkled appearance. It possesses eleven segments, each of which has a relatively broad, irregularly arranged strip of strong spines, as shown in figure 1. The spines are typically

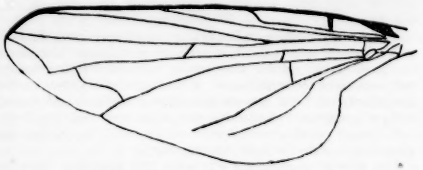


Fig. 3.—Wing of adult Phormia regina.

grouped in pairs, giving the appearance, under the microscope, of single, large, bifurcate spines. The larva possesses two sharp, curved mouth hooks and on the posterior segment there are about five papillae. The stigmal plate, which is of great diagnostic value, is shown in figure 2. The larvae in this case averaged 8 mm. in length when removed from the patient; at the posterior end they measured 1 mm. in breadth and tapered greatly toward the anterior end.

The adult of *Phormia regina* has a dark metallic bluish green thorax and abdomen. The thorax is hairy with both very short and long hairs, the latter being found particularly around the sides. The abdomen is covered with short hairs. There are no markings present. The wings are folded flat, scissors-like, over the abdomen. There is a row of stiff hairs on the inner margin of each eye. The adult female measures 6.5 mm. in length. The wing venation, which is an important diagnostic character, is shown in figure 3.

This species of insect is generally recognized as one of importance in connection with myiasis, but definite records of its occurrence in man in the United States are very rare. It is next in importance to the screw worm fly (*Cochliomyia macellaria* F.) in causing dermal myiasis in the tropical parts of the New World. This fly has been recorded from as far north as Alaska.

Phormia regina affects domestic animals, especially goats and sheep, quite frequently and is sometimes popularly known as "the wool maggot" in the larval stage. This fly is found very commonly around houses and privy vaults. It is one of the most troublesome flies around packing houses. It has been recognized as an occasional and accidental cause of intestinal myiasis.

DERMATITIS IN THE RUBBER INDUSTRY DUE TO A HYPERSENSITIVENESS TO HEXAMETHILENE-TETRAMINE *

WALTER S. BURRAGE, M.D., BOSTON

Dermatitis in the rubber industry is not an uncommon problem, as shown by numerous reports in the literature. Several studies of the various chemical substances involved have implicated hexamethylenetetramine [1] in a number of instances. Kratz [2] in 1917 wrote an article describing a rash among employees exposed to green rubber stock. The following year, a committee of the American Chemical Society [3] found hexamethylenetetramine responsible for a similar dermatitis, which disappeared when the patient left his work in the rubber factory. Shepard and Krall,[4] working with this catalyzer, or "accelerator," found that the rash appeared only on certain susceptible persons during hot weather. Their explanation was that hexamethylenetetramine, in the acid reaction of the sweat, was turned into formaldehyde and subsequently oxidized to formic acid, which in turn produced the dermatitis. On this theory, a saturated solution of sodium bicarbonate was used in the treatment with success in all cases. Cole and Driver [5] briefly discuss the same subject, saying in addition that "personal susceptibility may be a contributing cause." Quinby,[6] in considering hexamethylenetetramine as a factor among health hazards in the rubber industry, believes likewise that formic acid is a factor, as does also Cleveland [7] in discussing one case of dermatitis due to hexanitrodiphenylamine. Cronin,[8] studying sixty cases of dermatitis in one factory where the concentration of hexamethylenetetramine was only 0.1 per cent, found that the outbreak ceased as soon as a new "accelerator" was introduced. New cases appeared, however, as long as scrap rubber containing this compound was used in the factory.

While most reports stress the selectivity of the dermatitis for certain individuals in a group, little attention has been given to the possibility that these patients may have developed a definite hypersensitivity to the chemical. A recent outbreak of some sixty-four cases of dermatitis in a rubber products factory gave an opportunity to throw light on this aspect of the question.

The employees affected presented extensive rashes on various parts of the body, particularly on the hands and flexor surfaces of the arms. The rash appeared to start in small vesicles extending into erythematous and crusted lesions, which ran together, covering large areas. It was reported that as a rule the patients improved markedly after leaving their work, but that the trouble recurred as soon as they returned. With one exception, all the sixty-four patients were workers who had come into direct contact with, or had actually handled, the company's product in some stage of its production.

The fact that the dermatitis was not universal, that it occurred only in a certain number and not in all of the employees, suggested the similarity of the condition to the general group of allergic conditions in which certain individuals can develop a true hypersensitiveness to one or another foreign substance with which they come in constant contact. To test this theory, samples of the materials were obtained. Only one of them, the "accelerator," was at all soluble in water. Thereupon, a solution of this substance, said to be triethyl-trimethylene-triamine, and containing some hexamethylenetetramine, was sterilized by Berkefeld filtration and diluted to various concentrations. With these dilutions, both scratch and intradermal skin tests were then made on a series

* Research Fellow in Medicine, Harvard University Medical School.
* From the Anaphylaxis Clinic of the Massachusetts General Hospital.

1. Hexamethylenetetramine for medical use is described in the U. S. Pharmacopeia as methenamine.

2. Kratz, G. D.: Control and Prevention of a Rash Among Rubber Factory Employees, India Rubber World **57**: 146, 1917.

3. American Chemical Society: Report of Committee on Organic Accelerators, India Rubber World **59**: 146, 1918.

4. Shepard, N. A., and Krall, S.: Poisons in the Rubber Industry: The Rash Produced by Hexamethylenetetramine and Means of Prevention, J. Indust. Hyg. **2**: 33 (May) 1920.

5. Cole, H. N., and Driver, J. R.: Industrial Dermatoses, J. Indust. Hyg. **4**: 425 (Feb.) 1923.

6. Quinby, R. S.: Health Hazards in the Rubber Industry, J. Indust. Hyg. **8**: 103 (March) 1926.

7. Cleveland, D. E. H.: Dermatitis Venenata in the Rubber Tire Industry, Canad. M. A. J. **17**: 695 (Jan.) 1927.

8. Cronin, H. T.: Hexametylenamine Poisoning in the Rubber Industry J. A. M. A. **83**: 250 (July 26) 1924.

of normal and nonallergic persons. Thirteen normal persons tested with a 1:1,000 dilution were negative, both by scratch and by intradermal methods. With these negative observations as a background, two employees with severe skin disturbances were tested at the factory. Scratch tests were negative, but intradermal tests gave definitely positive reactions, with a central wheal and surrounding erythema occurring in twenty minutes in both patients, while the control tests with ragweed and chicken feather dilutions were entirely negative.

Since these observations were made, it has been learned that a different "accelerator," without the "hexa" element in it, has been used at the factory, and that no more skin disturbances have occurred.

While two cases is a small number, the fact that the tests in these two were so definite, and that the same tests in thirteen normal persons were negative, seems strong evidence to show that these patients had acquired a sensitiveness to some portion of the "accelerator" in the course of their occupation. It suggests that cases of dermatitis of this type should be investigated in the future, not alone from the chemical point of view but also as possible manifestations of allergy.

ATROPINE POISONING IN A CHILD

GEORGE HELLER, M.D., ENGLEWOOD, N. J.

F. S., a white boy, aged 6 years, was seen Nov. 17, 1928, at 11 p. m., because of "a strange look in his eyes." During the morning the child, who had previously been well, had shown a mild coryza, and to relieve this the mother had used a fluid that formerly had been prescribed by a laryngologist for an identical condition. Two drops of the medicine had been dropped into each nostril, with the head dependent, at 2 p. m. and again at 6 p. m.

The solution ordered had been a 3 per cent aqueous solution of ephedrine sulphate but, as was later determined, the original bottle had, by accident, been given a prescription number that represented an order for atropine sulphate, 1 per cent aqueous solution, and when a refill order was given by telephone, atropine was furnished. The bottle bore instructions for intraocular use but the parent had not observed this, assuming that the similarity of the numbers on the two containers was sufficient proof of their identity. There was nothing on the bottle to suggest the poisonous nature of the content.

When first seen, the child appeared to have an extreme pyrexia. The cheeks were flushed, the lips were dry and covered with a brownish crust, and the patient was very restless. On questioning he seemed well oriented and he obeyed simple orders, but his constant flow of words showed, at times, disorientation, delusions of place and identity, and weird hallucinations, purely visual in nature. His flow of words was incessant. The hectic flush was, according to the parents, the remainder of a crimson coloring of the entire face, neck and upper chest which had appeared suddenly several hours prior to my visit and was rapidly fading.

The patient was well developed but rather slender. The temperature was 99.4 (rectal), the pulse rate 110 a minute; the respiratory rate could not be estimated because of his incessant moving and talking. The head did not show any signs of recent injury; it was held normally erect. The eyes did not show any injection of the conjunctivae; the extra-ocular muscles functioned well, the pupils were dilated, only about a millimeter of iris being visible, and there was no reaction to light or in accommodation. A nasal discharge was not seen nor was there nasal obstruction. Except for the unusual dryness of the lips and a complaint that the throat felt dry, the buccal cavity did not show anything unusual. The chest was clear. The heart was not enlarged, and its rhythm was normal in rate and force. The abdomen was of normal contour. The deep reflexes were normally active, and Kernig's sign was absent. The abdominal reflexes could not be obtained, nor could I observe any cremasteric reflex. There was no muscular weakness. Ophthalmoscopic examination showed normal disk and vessels.

I felt confident that the symptom complex could be produced only by one of the atropine-like alkaloids, and, in the absence of other evidence, assumed that the medicinal solution, which I believed to be ephedrine, had been placed in a container that previously had contained atropine.

Considerable time had elapsed since the probable poison had been administered, and a fair amount of fluid had since been ingested; lavage, consequently, was not felt to be advisable. The signs were almost entirely those of central nervous system involvement, so pilocarpine hydrochloride was not given. Sedatives were contraindicated because subsequent depression was feared. Therapy was therefore restricted to large quantities of fluid by mouth, and long continued immersion in warm baths.

The mania reached its height at 2 a. m. and subsided gradually. Abdominal distention was noted eighteen hours after the onset of the symptoms, and, at this time, in six hours, three large, normal appearing stools were passed. The patient drank 3,500 cc. of fluid during the first twenty-four hours; the urine was pale and profuse, and free from pathologic constituents. Convulsions were not noted. The rectal temperature never reached 100. The pulse rate remained around 90 a minute for twenty-four hours. During the day following the ingestion of the poison there was an accentuation of the usual sinus arrhythmia, and during this period the heart would occasionally skip a beat; but the patient did not seem to have any unusual sensation as a result of this. The blood pressure at the height of the mania was 104 systolic and 70 diastolic; this being considered normal, no further estimation was made.

The patient remained awake until 10 p. m., November 18, continuing active and garrulous up to this time; he then slept eight hours and resumed his excited course, but less violently than before. Convalescence was uneventful, and on November 21 his conduct was quite normal, the pupils reacted normally, perspiration and salivation were normal, and the cutaneous reflexes were present. He seemed to remember his unusual conduct quite well.

COMMENT

The mania, dryness, ephemeral cervical and facial flushing, and midriasis were typical of atropine poisoning. The classic symptom of tachycardia was missing, nor did the patient show the occasional hyperpyrexia. I cannot explain the cardiac irregularity and the accentuated sinus arrhythmia. Recovery without consequent depression was surprising and gratifying.

A dosage of atropine sulphate of 6.3 mg. (1/100 grain) was given intranasally without causing death.

The possibility of future morbidity and mortality from this cause could be prevented by the required use of the word "poison" on bottles containing atropine. The mistake in labeling the original container was unfortunate, but one could not assert that it resulted from criminal negligence.

A SAFE REAGENT FOR USE IN THE PHENOLSULPHONPHTHALEIN TEST

J. DELLINGER BARNEY, M.D., BOSTON
Chief of Service, Urologic Department, Massachusetts General Hospital; Assistant Professor of Genito-Urinary Surgery, Harvard University Medical School

Ever since the introduction of phenolsulphonphthalein as a test for kidney function by Rowntree and Geraghty[1] in 1912, sodium hydroxide has been the reagent most frequently employed not only to determine the appearance time of the dye but also, by rendering the urine strongly alkaline, to estimate the percentage excreted in a given length of time.

My object in this communication is to call the attention of the profession to the fact that, although sodium hydroxide undoubtedly is an excellent reagent, it is a potential source of great danger. I would also call attention to two safe and satisfactory substitutes. While not only the dangers of the misuse of sodium hydroxide but also the substitutes for it may be familiar to many, I find on inquiry that there are still those who are not so informed.

The devastating effect of sodium hydroxide on mucous membranes, to which those of the genital and urinary tracts are no exception, is well known even when it is used in a strength of no greater than 1 per cent. Several instances of the harm it can do have come to my personal attention in recent years.

1. Geraghty, J. T., and Rowntree, L. G.: Phthalein Test of Urine, Arch. Int. Med. 9: 284 (March) 1912.

A phenolsulphonphthalein test was performed on a patient in a hospital. A solution of 25 per cent sodium hydroxide was used as the reagent. The bottle containing this solution was left standing on the mattress propped against the patient's thigh. The orderly was called away for a moment. When he returned the patient had upset the bottle and was lying in a pool of its contents. As a result of this brief contact with the solution, the skin on the back of the thighs and of the buttocks was badly burned and ultimately sloughed. The patient was confined to his bed for several weeks and suffered greatly. In another instance, a urologist inadvertently performed a bilateral pyelogram with sodium hydroxide, mistaking it for sodium iodide. The patient died a short time later. Another urologist, about to perform a cystoscopic examination, instructed an assistant to inject what was thought to be a solution of procaine into the patient's urethra. It proved to be a weak (1 per cent, I think) solution of sodium hydroxide. The patient experienced great distress almost immediately and ultimately developed a stricture of the urethra. This case ended in a lawsuit with an ultimate award to the patient of several thousand dollars. A similar case occurred even more recently, also in the practice of an excellent urologist. Here the patient was a woman. The nurse applied a weak solution of sodium hydroxide to the urethra, mistaking it for procaine. There was immediate pain and discomfort of great intensity continuing for some time, even though efforts were made at once to neutralize the alkali. While so far as I know no organic changes were brought about by the mistake, the patient sued the physician and recovered a large sum of money.

While it is true that such accidents are uncommon, a mistake may occur at any time. This is especially true when one considers how identical in appearance and consistency are solutions of sodium hydroxide, sodium iodide and procaine or cocaine.

As I see it, the obvious thing to do is to eliminate all possible sources of danger by abandoning the use of sodium hydroxide as a reagent in performing the phenolsulphonphthalein test and using in its place an innocuous alkali. A safe and efficient alkali exists in ordinary soap or in sodium bicarbonate. In the case of soap one can use it for determining the appearance time of the dye simply by dampening a gauze sponge or any piece of cloth with water, rubbing it on a cake of soap and letting the urine from either a urethral or ureteral catheter drip onto it. When the dye appears it will at once produce the characteristic pink color. Some may prefer a solution of soap, either ordinary soap suds, such as is used for an enema, or such a solution as is generally used in almost every hospital. It may be made up with one part of soft soap to eight parts of water. Liniment of soft soap is equally satisfactory. With any of these solutions the sponge or cloth is moistened as before and the urine allowed to drip on it. If one prefers to use a test tube, especially if fifteen minute separate kidney functions are to be done, one only has to pour a little of the soap solution into the tube, thus making it possible to determine not only the appearance time of the dye but also the percentage excreted.

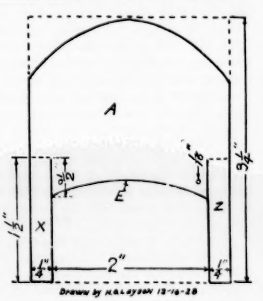
For those who prefer it, sodium bicarbonate may be used with equal success in the form of the tablet, which can be shaken up with the urine in a test tube, in the form of the powder or crystals, either rubbed on a wet sponge or placed in a test tube or as a saturated solution (about 9 per cent). As with soap, the reaction is strong and takes place immediately. I believe that soap has the advantage over sodium bicarbonate in that it is always at hand in one form or another, and, in the case of a solution of sodium bicarbonate, its resemblance to sodium iodide is such that it might be used as a pyelographic medium. Although, so far as I know, no harm would result, one would fail to get a shadow in the pyelogram. With either of these simple and safe reagents, the physician can obtain satisfactory results.

So strongly is it felt that sodium hydroxide is a potential source of danger that its use has been abandoned in all departments of the Massachusetts General Hospital except in the laboratories. When one considers the widespread use of sodium hydroxide and the innumerable tests in which it has been employed, it is remarkable that the accidents from its misuse have been so few.

AN IRRIGATION ACCESSORY

C. G. ANDREWS, M.D., MOHAVE CITY, ARIZ.

One may easily imagine that the edge of a piece of common tin pressed against the skin would make a tight joint with the skin, and so it does. So little pressure is needed that no discomfort is occasioned. It may be that this principle will serve in various situations as an aid to irrigation, as it certainly did in one instance for me in which a patient could not conveniently be moved from his bed. As is usual the bed sagged somewhat, and when it was necessary to irrigate sinuses in the patient's arm, which was fixed in vertical extension, I had visions of a rubber pad becoming a lake, with the subsequent necessity of changing the bedding, and so forth. To prevent this the device here illustrated was satisfactorily employed. The apparatus was placed just at the lowest edge of the discharging sinus and carried away the returning water into a basin set on the bed, without spilling a drop.



Diagrammatic plan for cutting and shaping piece of tin to form irrigation gutter.

The accompanying illustration is supposed to represent a piece of tin, which is to be cut as indicated by the solid lines. There results the broad piece *A*, with the edge *E* cut to approximate the curve of the arm. The plane of *A* is then curved slightly for gutter effect. There also result the two strips *X* and *Z*. These are to be bent at the dotted lines, one to one side of the plane and one to the other; their distal edges resting on the skin serve as supports. These strips also make it possible, when they are bent to this or that angle, to obtain for the gutter any fixed angle desired with the skin. An adhesive plaster strap snugly placed over each support suffices to hold the device in place, but it is more convenient to use strings pulled through the holes provided and tied around the arm. The device may be sterilized with the rest of one's paraphernalia.

MALIGNANT LEIOMYOMA OF UTERUS*

R. H. MCCLELLAN, M.D., MCKEESPORT, PA.

A. K., a woman, aged 46, was admitted to the surgical service of Dr. J. C. Kelly because of tenderness in the right lower quadrant, dysmenorrhea and menorrhagia, all of one year's duration. The past history and the family history were negative. The physical examination was negative except for the pelvis. Bimanual examination revealed an enlarged, tender uterus with a soft mass in the lower right quadrant. This mass was evidently attached to the uterus. There was a moderate, thin, blood stained vaginal discharge.

At operation the uterus was found to contain a large, rounded, soft tumor mass. The adnexa were essentially normal. An amputation was done, and when the uterine wall was cut through above the cervix, masses of tumor tissue were encountered in the myometrium. At some distance in the right broad ligament, vessels were found containing a like tumor mass. The whole material was sent to the laboratory for diagnosis. The operating room diagnosis was malignant tumor of the uterus.

The specimen as received from the operating room consisted of an amputated uterus with one tube and ovary attached. The uterus was distorted by a large, rounded, subserous tumor mass measuring 9 cm. in diameter. The tube and ovary did not show any gross pathologic changes. On gross section of the tumor mass, the cut surface showed a more or less definitely encapsulated tumor, the surface of which was soft and bulging and coarsely granular. Much of this soft tissue was easily scraped away and it was distinctly friable. The bulgings were not

* From the Pathological Laboratory of the McKeesport Hospital.

uniform, in that there were definite small areas of softening. The material was slightly brown, with gray predominating. On section of the uterine wall, the myometrium showed only two areas of like tumor tissue near the neck of the organ, one of which was apparently occupying a blood space—probably a venous sinus or vein. The cavity of the uterus was distorted because of the tumor and the endometrium was hemorrhagic and slightly hyperplastic.

Sections were taken from the main tumor mass and from the nodule from the myometrium. These sections under eosin-methylene blue stain showed a very cellular structure, suggesting lymphoid tissue. The capsule under section was seen not to be as distinct or sharply outlined as it appeared grossly. The cells making up the tumor varied somewhat in size, from those approaching the general appearance of mature and normal smooth muscle cells to others having a large oval nucleus with considerable cytoplasm and quite indefinite though rounded outline. The stain was somewhat paler in some cells than in others. Mitotic figures were seen. Under Mallory's phosphotungstic acid hematoxylin stain there was practically complete absence of fibrils, both of muscle cell and of fibrous tissue origin. The laboratory diagnosis was malignant leiomyoma of the uterus with secondaries in the myometrium and broad ligament.

COMMENT

Textbooks on pathology in general devote only a paragraph to malignant changes in leiomyoma of the uterus, or to original sarcomas of the uterus. Ewing gives a careful description and discussion, the essential features of which are a consideration of the probable origin of the tumors, a review of the literature and a statement of the cases he has seen. He has seen five such cases in twenty years; of these, three showed general metastasis and two local recurrences. Mallory describes the histologic picture and suggests that the terminology is not always correct, saying that the term sarcoma should be restricted to malignant tumors of connective tissue origin. In his experience this type of tumor is most often seen in the uterus, while Ewing states the tumors are most often seen in the gastro-intestinal tract.

In the literature there are numerous reports of studies of series of leiomyomas with the percentage of malignant tumors in the series. Some of these figures are as follows: Winter, 3.2 to 4.3 per cent; Imhäuser, 5.3 per cent; Aschoff, 1.8 per cent; Fehling, 2 per cent; Geist, 4.8 per cent; Wannekoss, 9 per cent, and Meyer, 4 to 5 per cent. Cullin reported eleven such tumors; Meigs, three, and Imhäuser, eleven. The best and most complete description that I saw was by Imhäuser.[1] His study was based on 208 consecutive fibroid uteri, observed over a period of five years with sarcoma and sarcomatous changes in mind. This author found eleven proved sarcomas in this group, or 5.3 per cent. Grossly, the most frequent picture seen was "bone marrow or brain tissue-like material which was friable and yellowish brown or grayish red in color with a loss of the usual sharpness of encapsulation." In the microscopic study, which was stressed, irregular size and shape of the cells, mitoses and immaturity were the outstanding features. Clinically, the symptoms which point to a malignant growth of this character are loss of weight, cachexia, slow development, pain independent of the menses, soft tumor, no response to roentgen therapy, and a thin, pinkish vaginal discharge. It is pointed out that roentgen therapy tends to hasten rather than stop this type of growth.

The principal difficulty seems to be in determining whether one is dealing with a tumor originating in connective tissue or muscle cells and whether it is originally a malignant growth or one that has become malignant through change in nutrition, environment or what not. Imhäuser suggested the use of special staining, by means of which he seems able to determine whether the cells in question are muscle or connective tissue. In the present tumor, I am unable to make a statement, without considerable doubt, as to either the origin or the type of the cell involved. Beyond a doubt, the cells are malignant in character and have already produced metastatic growth both at a distance and in the near tissues. Both the gross and the microscopic appearance confirms the diagnosis. The terminology must remain in doubt until more of this type of tumors are studied and the theories concerning their origin and status are confirmed.

1. Imhäuser, K.: Arch. f. Gynäk. **84**: 558, 1927.

Council on Physical Therapy

THE FOLLOWING ARTICLE HAS BEEN APPROVED BY THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION.
H. J. HOLMQUEST, Secretary.

RADIUM AND ROENTGEN-RAY THERAPY

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NEW YORK

As in every new method of therapy, that by radiation is still in a transition stage and it is important that the physician should have available a summary of current knowledge on the subject. For this reason the Council on Physical Therapy of the American Medical Association requested me to white a digest of the main points of this form of treatment so that those interested might have a compact statement of the value of the methods used and the types of cases suitable for treatment.

As every one knows, radiation therapy may be given by light of any wavelength, but the discussion here printed is confined to the use of the very short wavelengths of light emitted by roentgen ray tubes and radium. The use of relatively low voltage radiation in the therapy of dermatologic diseases has been treated by MacKee,[1] so that this article will be limited to a consideration of the use of roentgen radiation of the type ordinarily called "high voltage rays" or "deep therapy" and to radium. About half the paper is devoted to fundamentals concerning the production and qualities of roentgen rays and the methods of employing radium, together with the biologic principles that underly the practical application of these forms of radiant energy. The remaining half gives in very condensed form the most important facts concerning the types of disease which can or cannot be influenced by radiation therapy. It is hoped that this short summary of fundamental facts may prove useful to the practitioner who often has to decide what treatment the tumor patient shall have and perhaps also to the beginner in radiotherapy.

Fig. 1.—Oscillograph tracing showing half wave rectification obtained by 1 kenotron (current curve).

Deep roentgen-ray therapy is usually defined as that form of treatment in which the voltages employed are higher than 130 kilovolts, and, as usually practiced, from 150 to 200 kilovolts. Some form of filtration is invariably used to eliminate the longer wavelengths.

APPARATUS

The apparatus for generating the high voltage current is usually some type of alternating current transformer. If only continuous current is available, a motor-generator set must be employed to transform the direct current into the alternating form, which then is fed to the primary of the transformer and has its voltage raised to the limit mentioned. In its simplest form the transformer consists of a frame built of laminated soft iron on which is wound a number of turns of heavy insulated copper wire to carry the primary alternating current from the mains. Surrounding the primary is

1. MacKee, G. M.: Cutaneous Roentgen-Ray and Radium Therapy, J. A. M. A. **90**: 28 (Jan. 7) 1928.

the secondary winding composed of many more turns of comparatively fine insulated copper wire. The whole is placed in a steel tank containing heavy mineral oil to complete the insulation. The alternating current in the primary at a voltage of 110 or 220 volts induces in the secondary a voltage whose magnitude depends on the ratios of the primary to the secondary winding. If there are a thousand times as many turns in the secondary as in the primary and the primary voltage is 110, then there will be delivered at the terminals of the secondary approximately 110,000 volts. For the proper functioning of the tube this alternating current must

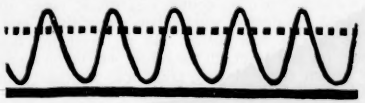

Fig. 2.—Oscillograph tracing showing full wave rectification of 500 cycle current with 2 kenotrons. The sine wave above is the current rectified, but without a condenser; the dotted line shows the current after the insertion of sufficient condenser capacity to remove all oscillations.

be rendered unidirectional, and this may be accomplished by mechanical or thermionic means. Mechanical rectifiers consist of various shaped commutators attached to the shaft of a synchronous motor fed from the same mains as the transformer primary. As these brushes or contacts pass the transformer poles the current is reversed twice on each rotation and passes out on the line as a series of unidirectional pulses. With thermionic rectification the kenotron type of rectifier is employed, which permits the flow of the current in only one direction (fig. 1). One kenotron permits, for example, only the positive phase of the current to pass from one side of the transformer; the other kenotron permits only the negative. When so rectified, the current still has an approximately sine wave form (fig. 2). By the insertion of suitable condensers and inductances on the line, this voltage fluctuation can be smoothed to any desired degree.

At present the mechanical type of rectification is in more general use. The machines with thermionic rectification have the advantage of being almost noiseless and, with complete elimination of voltage fluctuation, of delivering approximately twice the amount of radiation with the same voltage and current through the tube; but with high voltages they are very destructive of tubes and need much more careful watching than the older type. Apparently fluctuations in the kenotrons, overcharges in the condensers, and surges on the lines cause more disturbance in the apparatus at the higher voltages than with mechanical rectification.

The wave form produced by the mechanical rectifier varies a good deal in different machines and also varies in the same make with different positions of the contacts, so that a slight change in the setting may make a difference of 10 or 20 per cent yield of radiation. The ideal wave form is shown in figure 3, but this is rarely seen, the more usual type being that in figure 4. Great stress is laid on these wave forms by the dealers, but it is doubtful whether there is any practical difference in the amount of radiation generated by the different types. It will be noticed that during about half the time the voltage drops so low that no roentgen ray is produced. Therefore the mechanical rectification gives approximately only half the amount of radiation that the continuous current of the same average voltage produces. This may be shown not only by physical measurements but by exposure of tumors (fig. 5).

The Coolidge tube is almost universally employed in therapy at the present time. As produced commercially in the United States, these tubes have only a short life when used at more than 200 kilovolts, so that this voltage is the practical limit of running. When in action they should be enclosed in some sort of protective box covered with 6 mm. of lead. Lead glass, unless very thick, does not give sufficient protection. The operator must also be screened from the secondary radiation given off by the patient and the table. If the tube is in air, it is usually necessary to have some form of cooling apparatus if the wattage exceeds 1,600. If the tube is used in an oil bath, the fluid is sufficient to cool it. Water cooled tubes of high capacity are now available but they are expensive and have a short life.

The electron impact on the anticathode of the tube produces a continuous spectrum on which is superimposed the characteristic radiations of the metal of the anticathode, now usually made of tungsten. The extent of this spectrum toward the long side is limited by the glass wall of the tube; on the short side it is a direct function of the voltage. The shortest wavelength in angstrom units equals $\frac{12.35}{\text{voltage}}$. That is, for 10 kilovolts the wavelength would be 1.235 angstrom units. The point of greatest intensity for unfiltered rays is approximately $\frac{20}{\text{voltage}}$, or for 10 kilovolts about 2.0 angstrom units. Radiation softer than this is held back by the glass of the tube. At 200,000 volts the shortest wavelength is 0.06, the point of greatest intesity about 0.1 angstrom unit. The quality of the spectrum depends on the metal of the anticathode and the form of filter used. As tungsten is almost always employed as an anticathode, the characteristic radiations are the K lines of that element, which are at two points, one at 0.18 angstrom unit, and the other at 0.21 angstrom unit. By using these wavelengths in the foregoing formula, it will be seen that the characteristic radiations begin to be excited at about 69 kilovolts. A considerable proportion of the energy, even at higher voltages, lies in these two spectral regions. The only way in which a greater amount of rays shorter than 0.2 angstrom unit can be obtained is by the employment of a metal of higher atomic number,

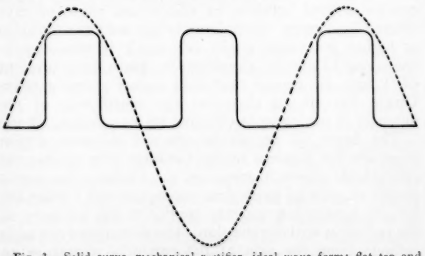

Fig. 3.—Solid curve, mechanical rectifier, ideal wave form; flat top and very small slopes; broken curve, superimposed sine wave.

such as platinum or uranium, but for practical reasons neither of these is as satisfactory as tungsten, and it is doubtful whether the slight advantage in the wavelength which might be gained by the use, for example, of uranium in which the K alpha line is 0.1008 instead of 0.21 would be noticeable in the treatment of tumors. A small gain in penetration might be obtained, but this is easily compensated by the employment of more exposure portals.

TECHNIC OF ROENTGEN RADIATION

The filtration used is today almost entirely confined to thin sheets of copper, zinc and aluminum. Aluminum is used for the lower voltages, up to 150 kilovolts, in thicknesses of 3 or 4 mm. This gives a filtration which allows a very considerable proportion of the longer wavelengths to pass and is suitable for the treatment of superficial neoplasms. When more penetration is needed, copper is the metal almost universally employed at present, in thicknesses of from 0.5 to 1 mm. An increase in the thickness of the copper filter above 1 mm. does not alter very much the effective wavelength of the beam, and greatly prolongs the time of exposure. Silver has been recommended as giving a little better quality and increasing the short wavelengths at the expense of the long, but no practical differences can be noticed between its effects and those of rays filtered by copper. Aluminum is not used for filtration at higher potentials, partly because it is necessary to use about 13 mm. of aluminum to obtain the equivalent of 1 mm. of copper, and this makes a bulky filter. Duane has shown also that the distribution of the intensity is not quite as effective with equivalent filters.

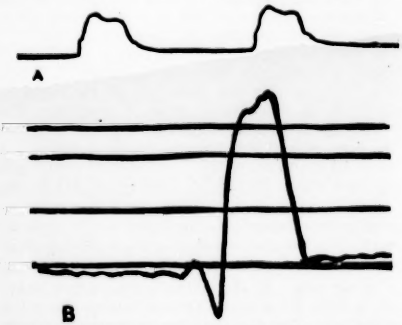

Fig. 4.—Oscillograph tracings of mechanical rectifier showing the usual wave form of an ordinary commercial machine. *A*, the voltage curve taken at about 70 kilovolt peak; *B*, current curve. The upper three horizontal lines in *B* mark, respectively, the flow of continuous current at 10 milliamperes, 20 milliamperes and 25 milliamperes. It will be seen that at the maximum current more than 25 amperes is flowing through the tube. A hot wire milliammeter in the circuit, however, showed only 5 milliamperes. As will be seen from figure 5, even the large instantaneous current which flows when the voltage is on does not compensate for the absence of x-rays in the interval, so that with equal voltage and milliamperage readings a continuous current apparatus is twice as effective biologically as a mechanically interrupted type.

The beam of negatively charged electrons driven from the hot filament of the Coolidge tube against the anticathode where it generates the roentgen ray rarely covers an area of more than one square cm.; hence the inverse square law roughly applies to the intensity of the radiation striking the skin. The distance of the anticathode from the skin of the patient is therefore an important factor. It is advantageous that this should be as great as possible within practical limits. These limits are prescribed by the time the patient can be kept under the apparatus without exhaustion and in consequence by the number of patients that can be treated, the replacement cost of tubes and apparatus and the general overhead of the plant. It is an advantage to have the tube at a considerable distance because the patient is not then in danger of contact with the high tension terminals. A second advantage is that any irregularity in the surface of the portion of the body irradiated is a smaller fraction of the whole when the distance is great than when it is small. Thirdly, when the tube is at a considerable distance, the beam is nearly parallel and consequently a greater depth dosage is obtained than when the tube is much closer. Practical limits are between 25 cm. and 80 cm., with a good average at 40 cm. It is a great advantage to use the same distance in all treatments, using 40 cm. for the lower voltages and employing a greater distance only under exceptional circumstances. If no fixed distance is employed, as is sometimes the case with oil-immersed tubes and tables not adjustable as to height, it is convenient to use a chart drawn on double logarithmic paper, giving a plot of the inverse square law, using times and distances as the coordinates. If an erythema dose is known for any point, all the others will lie on a straight line drawn through that point and another point at which the distance is double, and the dose is therefore one fourth. It is thus very easy to compute erythema doses for any measured distance by a glance at the chart.

Another factor which has to be decided with great care is the area of the patient's skin that is to be irradiated. This is of importance for several reasons. The first is that the larger the portal, up to about 20 by 20 cm., the greater the dose that reaches the interior of the patient, and also the greater the dose that strikes the individual cell on the surface, for the reason that with high voltages as much as 50 per cent of the energy entering into the tissues may be scattered back to the surface. Therefore when a large portal measuring 20 by 20 cm. is employed, the proper dose might be 50 per cent smaller than when a small portal is used; for example, 1 or 2 cm., such as is used in irradiating a small superficial tumor. If the erythema dose has been determined with large areas on a patient, a much larger dose must be given through a small portal, a safe proportion being about a 30 per cent increase.

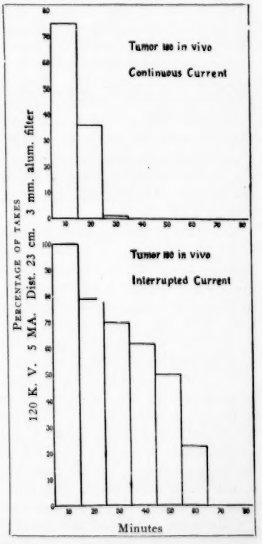
Tumor 180 in vivo
Continuous Current
Tumor 180 in vivo
Interrupted Current
PERCENTAGE OF TAKES
120 K. V. 5 MA. Dist. 23 cm. 3 mm. alum. filter
Minutes

Fig. 5.—Comparison of biologic effects of mechanical rectifier and continuous current machines at the same voltage and milliamperage. Highly malignant mouse tumor was used as a test object.

The depth dosage also depends on the portal, the voltage being the same, and with the same skin-focus distance. For example, with a portal of 20 by 20 cm., 200 kilovolts, and a 0.75 mm. copper filter, the depth dosage at 10 cm. beneath the surface is 40 per cent of that which falls on the skin, whereas with a portal of 5 by 5 cm., under exactly the same conditions, the depth dosage at 10 cm. is only about 25 per cent of that which strikes the skin.

TECHNIC OF RADIUM THERAPY

Radium is used either in the form of a dry salt, usually the sulphate, or as emanation (radon). The latter loses half its strength in about four days and all practical value in a month, so proper allowance must be made in computing dosage.

Radium is employed chiefly in two ways. One is as a surface applicator in tubes or packs, the other interstitially in needles. The rays from the tubes or packs are always filtered by one of the heavy metals—silver, brass, platinum or lead. The thickness used by different workers varies greatly. The thickness of the wall of the usual silver commercial container is 0.5 mm. Brass plates or tubes of 2 mm. are very largely used, as this thickness removes practically all of the beta radiation, leaving most of the gamma. Platinum is employed by Regaud and his school in a thickness of from 0.5 to 1 mm. or even more. This cuts out all the beta radiation and also removes some of the shorter gamma wavelengths above the K line of the platinum characteristic rays, at 0.16 angstrom unit. Lead, too, is used in a thickness of a millimeter or even 2 mm., and also absorbs a good deal of the short wavelengths above 0.14 angstrom unit, but of course removing very completely the longer wavelengths and all of the beta rays. When radium is used superficially, the characteristic radiation from the screening metal must be absorbed by some substance of low atomic weight, if a deep effect is desired, otherwise the skin will be severely damaged. Hard rubber is convenient. For brass or silver tubes, 2 mm. is sufficient; for lead or platinum, 4 mm. is necessary.

Needle containers are made of steel, monel metal (an alloy of copper and nickel), gold or platinum. The steel and monel metal pass a considerable quantity of the beta radiation and a large proportion of the gamma. Gold and platinum cut out the long gamma rays and also some of the short ones at the point above their characteristic lines, and if thick enough exclude all the beta rays.

Wide use has been made of small quantities of radon in thin glass tubes (seeds), to be buried in the tissues and left, but the trend at present is away from this technic, as severe caustic effects are produced by the soft beta radiation which passes through the glass. A method of producing gold capillaries 0.3 mm. thick containing radon has been devised by Failla to obviate this defect, but the French school regard this filtration as insufficient. As far as known, the gamma rays from radium extend from 0.08 to 0.006 angstroms, with an intense line at 0.05 and another at 0.08. From a physical point of view it is doubtful whether therapeutic differences should be found between equal quantities of gamma rays of 0.05 angstrom unit and roentgen rays of 0.15 angstrom unit. The primary action of both must be entirely intra-atomic.

There is no evidence at present to show that there is any difference between filtered roentgen rays and filtered radium in their biologic action. It has been shown that there is no difference in the biologic action between equal quantities of roentgen ray of different wavelengths, provided only that the roentgen ray is measured by an open ionization chamber. Technical difficulties have prevented the measurement of radium by the same apparatus, but the curve of killing *Drosophila* eggs with short wave gamma rays is exactly the same as that of killing with roentgen rays of any wavelength. If large quantities of radium were available at a low price it is probable that roentgen rays would be but little used in high voltage therapy except in a few special conditions in which great penetration of the tissues is not desirable; but the high cost of large quantities of radium prohibits its use except in a few institutions. A Coolidge tube at 200,000 volts and 5 milliamperes of current gives off an amount of roentgen ray equivalent to 15 Gm. of radium at the same distance. A single high voltage machine costing not more than $5,000 will easily run two high voltage tubes, the equivalent of 30 Gm. of radium. At the present price, that quantity of radium would cost more than $2,000,000. Thus it is impossible to use radium in the same way that the roentgen ray is used to treat large areas. The chief advantage of radium under present conditions lies in our ability to insert the radiating material into a tumor and thus give enormous doses locally, doses which could not be applied with roentgen rays which have to pass through patients' skin.

Thus the current practice in treating carcinoma of the cervix is to give from ten to fifteen erythema doses with radium within a space measuring only a few centimeters in diameter. This is the secret of the effectiveness of radium in this situation—the high concentration of its dose. When large quantities of radium are employed distributed in numerous tubes over a large area, at a distance from the skin of about 10 cm., a better depth dose is obtained than with roentgen rays, because the radium can be highly filtered and the very short gamma rays which pass through the heavy filters penetrate the tissues more easily than the somewhat longer roentgen rays. This greater effectiveness of radium, however, is limited to a few areas where the tumor to be treated is just beneath the skin. In most situations the roentgen ray is just as efficient as the gamma rays from radium and enormously cheaper to apply. Therefore the development of the technic of roentgen radiation is of the greatest importance from the public health point of view for but few persons can afford the cost of radium treatment nor is there sufficient radium in the world at present to permit the treatment of any but a small fraction of the cases of cancer which need radiation therapy.

PRACTICAL APPLICATION OF RADIATION

The treatment of deep seated lesions by the roentgen ray and radium is based on the assumption either that the cells of the tissues to be influenced are more sensitive to the radiation absorbed by them than those of the neighboring healthy tissues, or that the abnormal cells when injured repair less rapidly than the normal, or both. Unfortunately, neither of these assumptions is universally true, and the failure of deep therapy to produce a large proportion of cures in malignant tumors is primarily due to a lack of such a differential in at least a portion of the neoplastic cells; for most tumors are composed of cells of greatly varying resistance to radiation. A considerable proportion of the cells of a tumor of average sensitivity may be killed with one erythema dose, but a few cells will require for their destruction at least two or three times the dose necessary to kill the more sensitive group. From these cells of high radiation resistance, a recurrence of the tumor may take place.

A great deal of study has been devoted to the correlation between the histology of various types of carcinoma and their radiation sensitiveness. Rather discordant results have so far been obtained. In the

cervix, for example, those types which are the least differentiated, the most cellular and rapidly growing, and hence are clinically the most malignant, are most easily cured by radium. In the tongue and lip the best results have so far been obtained in treating the most highly differentiated types of epithelioma. Exceptions, however, are frequent. While of promise, the method therefore still needs many more careful studies of large series of tumors under a variety of conditions in order to clear up the paradoxical results occasionally seen.

In the use of radiation there are three fundamental factors: the relation between wavelength and biologic action; the relation between biologic action and some type of measuring apparatus, and the energy distribution of the radiation in the tissues.

Concerning the first of the points mentioned, the majority of those who have studied the question believe that if the roentgen ray or radium gamma rays are measured by the ionization produced in air at 760 mm. of pressure in an open ionization chamber, equivalent quantities have equivalent biologic effects, provided the cells or tissues tested have an atomic absorption comparable to that in the chamber. This means that such tests must be made on isolated cells or growing tissues or tumor fragments that measure not more than 1 mm. in diameter. In other words, under the conditions mentioned, the biologic effect runs parallel with the absorption of energy in the tissues. But this has been proved only for individual cells or small groups of cells. It does not mean that the clinical effects are necessarily the same; that is, that a skin erythema produced by low voltage unfiltered roentgen ray will give the same clinical picture as an erythema due to the same quantity of high voltage roentgen ray or highly filtered radium rays. Under these circumstances, the erythema is not due to the reaction of a single group of cells but is a complicated phenomenon dependent on such factors as innervation, vascular supply, lymph flow, type of tissue involved and biologic sensitivity of individual groups of cells. Nevertheless, when a tumor is treated, the destruction of the individual cells of that tumor, if they are destroyed directly by radiation, depends not on the wavelength but on the amount of energy absorbed in the individual cell. The cell death is determined by the relationship between that energy and the sensitivity of the cell. One of the most important things to emphasize as underlying the success or failure of radiation therapy is that, as has already been said, cells may vary greatly in their radiosensitivity, and that while some elements of a tumor are highly susceptible, others are highly resistant. If the highly resistant cells can withstand just as much radiation as the normal tissues which surround the growth, it is impossible to destroy such cells with radiation unless it is also possible to sacrifice the surrounding normal tissues. Whether a clinical cure may not be produced without destroying all the cells of the tumor is another question. It may be perfectly possible, but such a cure may be followed by a recurrence if the cells are enabled to get sufficient food to permit them to grow readily again. Unless, therefore, there is a considerable difference in susceptibility between the normal and the abnormal cells, the permanent cure of a tumor by radiation therapy is impossible, and this is the situation for most tumors at the present time.

That differences in susceptibility do exist is well known. Tumors composed of certain types of cells, lymphocytes, for example, are more sensitive to radiation than those composed of squamous epithelium. Slow-growing glandular tumors of the intestinal tract are much more difficult to influence than the rapidly growing tumors of the breast, but the crux of the problem lies in the fact that none of these qualities are invariable. That is, a lymphosarcoma may be highly resistant, and a glandular carcinoma of the rectum may be highly sensitive. The reason for this variability is not understood. Nor should it be thought that such variability is a property of tumor cells only. It exists in all cells. If, for example, a group of paramecia is obtained by allowing a single individual to divide until fifty descendants of the original cell are obtained all of the same age, each one of these paramecia will be found to have different cell-membrane permeability and a different resistance to irradiation in addition to other biologic differences.

These differences in susceptibility may in experienced hands yield facts of diagnostic value. For instance, in certain obscure conditions in which for some reason a biopsy may not be considered prudent, the reaction of enlarged nodes to a moderate dose of radiation may give some clue to the nature of the lesion. Lymphosarcoma shrinks rapidly as a rule; Hodgkin's nodes more slowly from the same dose, while nodular tuberculosis shows no immediate effect and carcinoma no result at all.

As we do not know the relative sensitiveness of most of the cells of a human tumor, we certainly do not know the dose that is required to kill all the cells in any given type of growth. The only quantitative investigations that have been made were with animal tumors, in which it has been found that, eliminating scatter and portal conditions, approximately four or five light skin erythema doses are required to kill all the cells of most animal tumors. A few tumors are more resistant than this, and others less, but the figures given are the average for highly virulent tumors. When full advantage is taken of secondary scattering, such as occurs in the tissues of a human being, this dose is equivalent to not much more than two to three erythema doses on the surface of the body with a large portal. Most careful students of the results of treating human cancer now agree that the lethal dose of similar human and animal tumors is approximately the same.

When it was shown some years ago by Seitz and Wintz that many carcinomatous skin nodules could be caused to disappear by a dose of about 100 to 110 per cent of a skin erythema dose, it was thought that the only essential for the cure of cancer henceforth was to administer this dose and wait for results. It was shortly found that the situation was much more complicated. In some patients, after the administration of such doses, no further return of the tumor took place; in others, there was regression with a prompt recurrence; in still others, there was actually no checking of the growth rate of the neoplasm. The excision of a small piece from one of these clinically healed tumors several years after the disease has become quiescent often reveals the presence of apparently living cancer cells, and that these cells are living has been shown of late by the many recurrences among the patients originally supposed to have been cured. The disillusionment was bitter but necessary, and a saner point of view is now prevalent.

The occasional clinical cure of certain tumors with small amounts of radiation has also led to the idea that all that was necessary to cure a tumor was to injure it slightly by the roentgen ray, and that then certain

mystical defensive reactions sprang into activity and destroyed the rest of the cancer. There are two experiments which disprove this; in one, an area of skin filled with secondary nodules is irradiated with part of the tissue covered with narrow strips of lead. When a sufficient dose is given, the tumor cells will disappear in the areas not covered with lead and will remain in the areas protected. Evidently any defensive reaction must be absolutely limited to the region of the cells exposed and does not act at a few millimeters' distance. Another proof from animal experimentation is the observation that the cure of cancer in an animal requires just about the same dosage of radiation whether the tumor is treated and left in the body or is treated outside the body, and then grafted into a fresh, healthy animal. If there is any defensive reaction, it should have made itself evident in the shortening of the dose required to cure the tumor treated and left in the living animal.

ESTIMATION OF DOSE

There is no practical physical measuring apparatus made at the present time which is reasonably inexpensive, rugged enough to be handled by the average technician, and accurate. By "accurate" is meant giving measurements which correspond to the biologic doses. There are a number of ionization chambers with electroscopes or galvanometers which are highly recommended but which are expensive and difficult to manipulate. The practitioner of radiotherapy is therefore thrown back on the primary calibration of his machine by the makers, and thereafter a careful progressive exposure of small areas of the skin of patients is necessary to obtain some estimation of the limiting dose practicable to give, that is, the skin erythema, remembering that a variability of some 20 per cent exists between dark and light skins, and also that children are more susceptible than adults. It is not wise to make these exposures on portions of the body not ordinarily covered by clothing unless absolutely necessary, as atrophy of the skin with venous dilatation may subsequently occur. Once, however, such an erythema is obtained through a small portal, it must be remembered that this is 30 or 40 per cent higher than is that with a large portal, if the voltage is above 150 kilovolts. Attempts have been made to use biologic indicators, root sprouts of peas or beans, tumor cells, or the eggs of the fruit fly *Drosophila*. Of these biologic measuring materials, the fruit fly egg is the most convenient but requires experience in its use. Some 90 per cent of the eggs are killed by a light human skin erythema dose or about 500 r units.

When the erythema dose is finally determined, the exact position of the controls of the machine should be noted. If there is any resistance in the primary, it alters the wave form; and the amount of that resistance is important to know, not in absolute units, but in its effects on the erythema. Consequently in treating patients the controls should always be set in the same way as that in which the test erythema was obtained. Such resistance in the primary flattens out the waves and thus lowers the voltage across the tube, though this does not necessarily show on the voltmeter.

Radium may also be tested in the same way, each preparation of the salt being calibrated by cautious exposure of small skin areas. Small platinum-iridium needles containing 1 mg. of radium give an erythema when in contact with the skin in about one hour, monel metal or steel needles of 10 mg. content in half an hour. Four such 10 mg. needles inserted at the angles of a cube of tissue 1 cm. in dimension give an erythema at the center of the mass in one hour.

The third question, that of knowing the distribution of the dosage through the course of the tissues, cannot be determined by the practitioner of radiotherapy, but should be obtained from tables, which are in many of the textbooks on roentgenology. Diagrams showing the doses at various depths can be purchased, and should be hung on the walls of the rooms in which radiotherapy is carried on. Such distribution of radiation in the tissues is usually expressed as the fraction found at 10 cm. depth as compared to the skin surfaces. For example, a 20 per cent depth dose means that if the amount of roentgen radiation falling on the skin is considered as 100, at a 10 cm. depth of water or tissue, the amount of radiant energy would be only one fifth of that on the surface.

Closely correlated with the question of depth dose and portal is the protection of the patient from scattered radiation or the employment of larger areas than are necessary to cover the region to be exposed. In all cases in which it is possible, lead of at least 3 mm. thickness should be used. With higher voltages the tube should be included in a case with a lead wall not less than 6 mm. thick. The protecting lead should not be placed immediately in contact with the patient, as secondary radiation from this metal at 200,000 volts has a considerable penetrating power and might burn the skin. It is therefore necessary to interpose some sheet rubber or cloth. Leaded rubber gives sufficient protection at the lower voltages. A closely related problem is whether the dose given in five minutes is equivalent to a dose given in an hour. It has been found that it is not. If a skin erythema is obtained in ten minutes, one minute given on ten successive days will not produce a skin erythema, but fourteen or fifteen minutes' total exposure will be required. Opinions still widely differ as to the effective value of these two types of dosage. It has been heretofore the German and American practice to use a maximum intensity and to shorten the period of exposure as much as possible. The French school, under the leadership of Regaud, has tended in the opposite direction, giving, say, 15 per cent of an erythema of highly filtered radiation (2 mm. of copper, 230 kilovolts) on ten successive days. Excessive damage to the skin will not be produced under these circumstances, and Regaud believes that the results are better. Recently in Germany there has been a drift toward dividing the single heavy dose originally advised into four or five partial doses and distributing them over a week's time. The reason is that just as good final results are said to be obtained, and that the severe constitutional injury to the patients, expressed in fever, prostration and anemia, are to a certain extent avoided. However, no final decision as to the relative advantages of these two methods can be offered at present.

There is still much discussion as to the stimulating power of very low doses of radiation, and the question cannot as yet be regarded as finally settled. One moot point, however, has been determined, and that is that radiation of any type does not tend to "spread" a cancer or to cause metastases. Clinicians are often misled by observing unexpected metastases in irradiated patients, but this means only that the patient's life has been so prolonged by the treatment that sufficient time has elapsed to permit extensive or unusual metastasis to develop.

(To be continued)

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 9, 1929

XANTHOMA

In a discussion of xanthoma at the meeting of the American Dermatological Association last year, Professor Bloch of Zurich remarked that heretofore this has been one of the few metabolic diseases of the skin about which a simple explanation seemed to be available. It has been assumed that a pathologic metabolism of cholesterol underlies the development of xanthomatous lesions. The commonest hypothesis postulated that there may be some fundamental hepatic disturbance followed by hypercholesterolemia, and that the deposit of cholesterol in the xanthomatous tissue is a simple consequence of the latter. Different writers have alleged that xanthomatous masses of various kinds all seem to be composed of deposits of esters of cholesterol as a sequel of protracted hypercholesterolemia, the deposits leading in turn to proliferative and phagocytic reactions in the fixed tissues. The explanation has also been ventured that xanthomatous tumors are due to a peculiar affinity of a cell to attract cholesterol.

Recent studies of Wile, Eckstein and Curtis [1] at the University of Michigan Medical School in Ann Arbor compel an adoption of a more critical attitude toward the problem of xanthoma, if they do not actually entail a complete overthrow of preconceived ideas. Chemical analyses of xanthomatous lesions showed an excess of fatty substances other than cholesterol. Cholesterol occurs in xanthomatous lesions to the extent of only 16 per cent of the entire fatty materials present, and only 2 per cent of the solid content of the lesion. Furthermore, xanthomatous masses frequently occur with the absence of high values of cholesterol in the blood.

There is an apparent reason, however, for the earlier seemingly untenable points of view. Many patients who exhibited the xanthomatous conditions have been diabetic. Diabetes is frequently associated with lipemia, including a high cholesterol content of the blood. The occurrence of xanthoma in such persons may represent a coincidence with the hypercholesterolemia rather than any direct etiologic relationship. According to the Michigan investigators, the concept that the production of xanthomatous lesions is probably due to disordered fat metabolism is presumptive. That cholesterol takes part in this disturbance as a component of body fats is also self evident. That an increased cholesterol in the blood is the primary cause of such tumors cannot be reconciled with the negative observations on the blood in their cases and in others, and in the chemical analysis of the tumors, which shows a cholesterol content not exceeding normal values for the epithelium, and far below the content of other fatty materials in such lesions. Furthermore the extremely high incidence of lipemia, with the associated increase in cholesterol in general diseases, and the extremely rare occurrence of xanthoma do not suggest an immediate cause or relationship between these two conditions. In fact, when the cholesterol content is highest in the blood under pathologic conditions, one almost never finds xanthomatous lesions; that is, in pathologic lipemia and in jaundice. Further researches on the genesis of xanthoma are urgently required. The prospect of success is enhanced by the circumstance that more adequate biochemical methods of analysis are now available to supplement the histologic examinations on which reliance was more generally placed in former years.

1. Wile, U. J.; Eckstein, H. C., and Curtis, A. C.: Lipid Studies in Xanthoma, Arch. Dermat. & Syph. **19**: 35 (Jan.) 1929.

THE METABOLISM OF ESKIMOS

The physiologic studies of recent years have given prominence to the problems of ketogenesis. It has long been known that the defective oxidation of fats in the body may give rise to the production of substances formerly described as "acetone bodies." The relative availability of carbohydrates in metabolism seems to determine whether or not ketosis occurs under conditions of fat combustion. Recalling the old somewhat fanciful dictum that "fats burn in the flame of the carbohydrates," Macleod has amplified its implications by the statement that "if the carbohydrate fires do not burn briskly enough, the fat is incompletely consumed; it smokes, as it were, and the smoke is represented in metabolism by the ketones and derived acids." In dietary practice it has become customary to take into account the ketogenic-antiketogenic balance in man. The substances that may give rise to the ketone substances in metabolism are the fatty acids and certain of the amino-acids. The substances that have an opposite effect, that is, the antiketogenic substances, are the carbohydrates, the sugar-forming amino-acids and glycerol.

The lack of adequate carbohydrate combustion in diabetes furnished the explanation for diabetic ketosis in the days before the advent of insulin. Starvation, with its early exhaustion of preformed carbohydrate

stores of glycogen in the body, also leads to ketosis. To a certain extent an analogy with the metabolic conditions in diabetes and inanition is afforded by a dietary regimen from which carbohydrate is missing. This is approximately the situation present in the life of the Eskimo. According to Heinbecker,[1] who made careful observations with the Putnam Baffin Island expedition, the Eskimo in his natural state eats little else but flesh. It is impossible for him to do otherwise, as plant life of a type yielding edible material does not exist. Occasionally a bit of kelp or a few blueberries are eaten, but they cannot be considered articles of diet. All animals found in the North are eaten by Eskimos, but they now depend mostly on those found in the sea. Especially is this true of the polar eskimos, as caribou and musk-ox are practically extinct in the Thule district. The central Eskimos can still secure both these animals at certain seasons of the year. The seal is the animal most constantly and most universally depended on. Not only is its flesh highly prized but the oil obtained from it furnishes heat and light. Other animals of importance are the walrus, the narwhal, the white whale, the polar bear and the arctic hare. Dogs are eaten only in time of stress. Fish are not found to any extent where the polar eskimos dwell, but they become increasingly plentiful farther south. Everywhere water birds are found in large numbers and are extensively hunted, especially eider ducks, auks and murre. Eggs of all these birds are consumed in large numbers. Eskimos drink large amounts of water.

Here then would seem to be a condition in which, owing to the dietary restriction to protein and fat, one would expect ketosis to occur. There have been indications in earlier data secured by the Kroghs [2] that the calculated antiketogenic effect of the large protein ingestion is somewhat more than enough to offset the ketogenic effect of fat plus protein. Heinbecker has had an opportunity to make further direct observations. Even under conditions of fasting, he finds, the Eskimos show a relative nonsusceptibility to ketosis. Heinbecker inclines to the opinion that this race requires less carbohydrate to burn its fat. The data, he concludes, are consistent with the hypothesis that there are two mechanisms possessed by the animal organism for the combustion of fat, one of which involves the coincident combustion of carbohydrate. The varying ketogenic-antiketogenic ratio might then be a function of the relative effectiveness of these two biologic mechanisms, with the further possibility that adaptation to a low carbohydrate diet can be brought about by an increase in the effectiveness of the direct mechanism for the burning of fat.

The Eskimo dietary raises anew some of the problems of high protein intake. According to Heinbecker's analyses, the nonprotein nitrogen of the blood of Eskimos is similar to that of other races. The results do not indicate any retention of nitrogenous products in the blood from the habitual high protein diets. This is consonant with the recent report of Lieb and Tolstoi [3] on two arctic explorers who had been restricted to a diet of cooked or raw meat with some fat for several months. Both were in excellent condition and showed no evidence of impaired health. There was no evidence whatever of renal impairment. The chemical composition of the blood was little affected, except for a slight increase in uric acid and a temporary lipemia. The latter occurred significantly and only after unusual amounts of fat had been taken.

1. Heinbecker, P.: Studies on the Metabolism of Eskimos, J. Biol. Chem. **80**: 461 (Dec.) 1928.
2. Krogh, A., and Krogh, M.: Meddelelser om Grønland **51**: 1, 1914-1915.
3. Lieb, C. W., and Tolstoi, E.: Effect of an Exclusive Meat Diet on Chemical Constituents of the Blood, Proc. Soc. Exper. Biol. & Med. **26**: 324 (Jan.) 1929.
4. Benedict, F. G., and Parmenter, Hazeltene S.: Human Skin Temperature as Affected by Muscular Activity, Exposure to Cold, and Wind Movement, Am. J. Physiol. **87**: 633 (Jan.) 1929.
5. Benedict, F. G.; Koropatchinsky, V., and Finn, M. D.: J. de physiol. et de path. gén. **25**: 1 (March) 1928.

TEMPERATURE OF THE SKIN

There are few measurements of bodily phenomena to which the physician has occasion to refer more frequently than the measurement of the temperature. Its relative constancy during health serves as a sign of well being, and divergences from the "normal" range are invariably looked on as indicative of disease or at least of some serious physiologic upset. Small differences in the temperature of the body are recorded when the examinations are made by rectum, by vagina or in the stream of urine as contrasted with oral readings. At most, the real temperature of the internal structures may exceed the record by mouth to the extent of about one degree Fahrenheit, and the diurnal variations in a given individual do not exceed three degrees.

The surface of the body is the seat of the elimination of heat, a function of major importance to a heat-producing organism that attempts to maintain a fairly constant temperature. According to Benedict and Parmenter,[4] under normal conditions of rest about 75 per cent of the heat lost from the body is from the skin, chiefly by radiation, and 25 per cent is by vaporization of water from the lungs and skin. Hence the measurement of skin temperature of itself becomes suggestive in studying the conditions of heat loss. As the latter is almost directly proportional to the difference between the temperature of the skin and the temperature of the environment, measurements of skin temperature should be helpful in indicating the rate of heat loss from different parts of the body, especially in any study of the loss of heat by radiation.

Since a simple technic has become available in recent years for the measurement of cutaneous temperatures [5] in man, it has been found that the skin may attain a surprisingly low temperature while the tissue a little below the surface may record the expected normal figure for body temperature. One must recall in this

connection that beneath the skin is a layer of fat acting as an insulator and diminishing the conduction of heat from the tissues to the overlying skin. Heat is brought near to the surface by the blood circulating in the cutaneous vessels.

The latest actual records [4] of human skin temperatures under varying conditions of activity and consequent heat surplus have been rather surprising. When one has been lying for a long period, well covered with bedclothing, the skin temperature is fairly even and in general averages not far from 33 or 34 C. (91.4 or 93.2 F.). This obtains, however, only after a relatively long stay in bed. Most of the day is not spent in bed, and to ascribe a uniform skin temperature of 34 C. to the entire body is probably erroneous. Many measurements were made by Benedict and Parmenter on the thigh, leg, foot, head and waist, and in almost all instances the average of the points measured was below 30 C. (86 F.), in one case as low as 24.2 C. (75.5 F.), after walking outdoors in the cold. In accord with the opinion of Bazett [6] of the University of Pennsylvania, in spite of the protection of winter clothing and the heat produced by exercise, cold may produce a drop in skin temperatures in the extremities. Bazett states that exposure to cold or to warmth may cause changes in temperature in one part of the body at the expense of another, without this being demonstrable by measurement of the rectal temperature.

Benedict and Parmenter have definitely demonstrated that exposure to severe cold, with or without strenuous muscular exercise, results in a lowering of the skin temperature, chiefly of the extremities, a lowering which cannot be counteracted even by the great production of heat in the strenuous exercise of winter sports. During short periods of severe exercise, such as walking indoors on a treadmill or walking upstairs, the metabolism may be increased more than five or six hundred per cent, and yet at the same time the peripheral temperature will be lowered temporarily. Even when the skin has been previously cooled by removal of clothing and there has presumably been some restriction of cutaneous circulation, moderately severe muscular exercise (for five minutes) may raise the metabolism five or six hundred per cent without causing an increase in skin temperature, as would be expected when provision must be made for increased heat loss. To Benedict and Parmenter the most plausible explanation of these alterations in skin temperature following exercise is that possibly a vasoconstriction of the peripheral vessels results in a temporary transport of blood from the periphery to the muscles, at least in the initial stages of muscular work. One obvious suggestion derived from investigations on cutaneous temperatures, according to Benedict and Parmenter, is that the modern clothing of women when dressed for the house certainly affords scanty protection. Sport clothes are somewhat heavier and undoubtedly more protective, but it is a question whether this protection is such as to maintain an equable skin temperature under conditions of outdoor activity. This is only another indication that the problems of the hygiene of clothing still call for careful investigation.

6. Bazett, H. C.: Physiol. Rev. **7**: 544, 1927.

Current Comment

ERGOSTEROL AND CATHODE RAYS

Few discoveries in recent months have aroused more interest in medical circles than the announcement that a well defined and physiologically apparently inert chemical substance, ergosterol, long known as a constituent of certain plant products and of yeast, can acquire remarkable biologic potencies through brief exposure to ultraviolet rays. Experiments reported by Rosenheim and Webster [1] and by Hess and Windaus [2] have indicated that the irradiated sterol may be converted into a powerfully antirachitic substance, so that as small a dose of irradiated ergosterol as 0.0001 mg. daily cures or prevents rickets in rats kept on a rachitogenic diet. Assuming, for purposes of illustration, an average daily food intake of 5 Gm. by one of these rodents, the effective dosage represents one part in fifty millions of the ration. Indeed, as at most only a small fraction of the ergosterol becomes potent through the current methods of irradiation, there is reason for assuming that the antirachitically potent material need not be more than one part or less per billion of the food eaten to protect the animal when the diet otherwise predisposes to rickets. More recently it was demonstrated by Knudson [3] of the Albany Medical College and his co-workers in the Research Laboratory of the General Electric Company in Schenectady that the high voltage cathode rays developed by Coolidge also may transfer antirachitic potency to ergosterol and substances containing it. Their experiments show that this sterol exposed to cathode rays with the tube operating at from 180,000 to 200,000 volts is not rendered as potent as when subjected to ultraviolet irradiation from a mercury vapor quartz lamp. The highest potency that they obtained by cathode ray exposure was 0.0005 mg. daily, and by ultraviolet irradiation 0.00002 mg., for a rat on a suitable rachitogenic diet. Ergosterol exposed to ultraviolet radiation for fifteen seconds was more potent than that exposed for thirty minutes. Ergosterol exposed to cathode rays undergoes a similar change in the absorption spectrum as when exposed to ultraviolet radiation. Yeast, cholesterol and ergosterol were not activated when exposed to cathode rays behind a quartz plate. These experiments indicate, therefore, that the antirachitic properties produced by cathode rays are not due to exposure to ultraviolet radiation produced by the rays themselves.

1. Rosenheim, O., and Webster, T. A.: Lancet **1**: 306 (Feb. 5) 1927; Biochem. J. **21**: 389, 1927.
2. Hess, A. F., and Windaus, A.: Proc. Soc. Exper. Biol. & Med. **24**: 461, 1927.
3. Knudson, A., and Coolidge, W. D.: Proc. Soc. Exper. Biol. & Med. **24**: 363, 1927. Knudson, A.: Science **66**: 176, 1927. Knudson, A., and Moore, C. N.: Comparison of the Antirachitic Potency of Ergosterol Irradiated by Ultraviolet Light and by Exposure to Cathode Rays, J. Biol. Chem. **81**: 49 (Jan.) 1929.

UNDERTAKERS AND POSTMORTEMS

The Chicago Undertakers' Association, which is the leading organization of morticians in Chicago, has just begun the circulation of a questionnaire among the families of persons who have availed themselves of the services of members of the undertakers' association. Among other interrogations, the questionnaire asks whether or not the deceased was attended by a physician, whether or not an autopsy was performed on the body and by whom, whether or not consent was obtained for the autopsy, the nature of the autopsy, and the condition of the body thereafter. The questionnaire concludes with the following significant question: "Will the nearest relatives and next of kin consent to bring suit against those participating in and responsible for said unwarranted and illegal autopsy?" Here is clearly an attempt to incite prejudice and malice against postmortem examinations. Apparently also the undertakers' association would urge families to bring legal action against any one participating in and responsible for an autopsy. The campaign for recognition of the scientific value of postmortem examinations has been a difficult one, a constant battle against prejudice, ignorance and superstition. The profession of undertaking has been attempting in recent years to raise itself from the position of a pitiable trade to that of a recognized profession. In this campaign it has even attempted the adoption of a completely new terminology through which undertakers have become morticians, undertaking parlors have become chapels or mortuaries, hearses have become limousine funeral cars or casket coaches, the remains or the corpse has become the body or the patient, and even the coffin has become a casket. It will require, however, something more than a change in nomenclature to develop for this group a scientific type of mind. Until the morticians learn to appreciate the significance to the living of proper scientific study of the dead, they will continue to be simply undertakers regardless of what they may call themselves.

METABOLISM IN CYSTINURIA

The pathogenesis of cystinuria still presents a number of unsolved problems. The fact that proteins in general yield cystine when they are disintegrated obviously leads to the suggestion that cystinuria is an anomaly of metabolism in which the sulphur-containing amino-acid derived from the catabolism of proteins escapes further oxidation and consequently is in part at least eliminated as such through the kidneys. In consonance with this idea is the observation, frequently made in the past, that cystinuric patients tend to excrete more cystine when there is an increased intake of protein. The circumstance, also attested by numerous observations, that cystine may appear in the urine of abnormal persons, even during starvation, does not negate the protein origin of the excreted cystine; for proteins inevitably are disintegrated in the body when an inadequate supply is furnished in the diet. It is possible, accordingly, to distinguish between cystinurias of exogenous and of endogenous origin. More confusing, however, is the fact that patients who invariably eliminate some cystine are able to oxidize completely several grams of the amino-acid daily when it is fed as such to them. This has been recently demonstrated by Lewis and Lough[1] of the University of Michigan Medical School at Ann Arbor, who have also fed to a suitable cystinuric patient diets relatively high in protein and of approximately the same nitrogen content, but varying in their content of cystine. No greater excretion of the latter was observed on diets that should yield the large amount. Comparison was also made of the effects of two diets: one, of relatively high protein but low cystine content; the second, of lower protein concentration but furnishing a greater amount of cystine than the first. The excretion of cystine varied with the total nitrogen excretion and did not appear to be related to the cystine content of the diet. Tentatively the Michigan biochemists suggest that the origin of the cystine excreted in cystinuria may be largely endogenous. Diets high in protein content are known to stimulate metabolism through the specific dynamic action of the protein. The effect of high protein diets in increasing the urinary output of cystine in cystinuria may be due similarly to a stimulation by the protein of some processes of endogenous metabolism, which results in the production of cystine, rather than to the failure to oxidize the exogenous cystine present in greater amounts in a high protein diet. The variations observed in the metabolic behavior of persons with cystinuria already examined in various parts of the world suggest the imperative importance of studying carefully every patient who may be brought to the attention of physicians.

Association News

ABSTRACT OF MINUTES OF MEETING OF BOARD OF TRUSTEES HELD IN CHICAGO, FEB. 21, 22 AND 23, 1929

A meeting of the Board of Trustees was held in Chicago on Thursday, Friday and Saturday, February 21, 22 and 23.

REPRESENTATION ON COMMISSION ON STANDARDIZATION OF BIOLOGICAL STAINS

Dr. John W. Churchman, New York City, was appointed to represent the American Medical Association on the Commission on Standardization of Biological Stains.

COOPERATION WITH U. S. VETERANS' BUREAU

The committee appointed by the Board of Trustees at its February meeting to cooperate with the U. S. Veterans' Bureau reported on its meeting with representatives of the U. S. Veterans' Bureau, in Washington, Dec. 5, 1928, and was continued.

PROPOSED INCREASE IN THE TARIFF ON SURGICAL INSTRUMENTS

The Board went on record as opposing the increased tariff on surgical instruments, and authorized the sending of a letter to the Ways and Means Committee of the House of Representatives to the effect that an increase in the tariff was likely to result in material increases in the prices of surgical instruments that will impose a burden on the medical profession and on hospitals, which would be reflected in the cost of caring for the sick and injured.

1. Lewis, H. B., and Lough, S. A.: The Metabolism of Sulphur: XIV. A Metabolic Study of a Case of Cystinuria, J. Biol. Chem. 81: 285 (Feb.) 1929.

ELECTIONS

Nominations to fill vacancies on the Council on Pharmacy and Chemistry and on various committees were considered, and the following appointments were made:

Drs. C. W. Edmunds and W. McKim Marriott were elected to succeed themselves, and Dr. Eugene F. Du Bois was elected to succeed Dr. Treat B. Johnson on the Council on Pharmacy and Chemistry.

Drs. W. B. Cannon and Lewis H. Weed were elected to membership on the Committee for the Protection of Medical Research. This committee, therefore, is now composed of Drs. Elliott C. Cutler, chairman; William Pepper, William Ophüls, Simon Flexner, G. W. McCoy, A. J. Carlson, W. B. Cannon and Lewis H. Weed.

Dr. William F. Petersen, professor of pathology and bacteriology, University of Illinois College of Medicine, was appointed to represent the American Medical Association on the Division of Medical Sciences of the National Research Council, to succeed Dr. E. R. LeCount, whose term has expired.

INCREASE IN PRICE OF THE AMERICAN JOURNAL OF DISEASES OF CHILDREN

With a view to making additional improvements in the *American Journal of Diseases of Children* and possibly enlarging the periodical still further, to take care of the increasing demands on its space, it was decided to increase the subscription price to $8 a year, beginning Jan. 1, 1930.

BILL AUTHORIZING THE GOVERNMENT TO PAY FOR INFORMATION CONCERNING VIOLATIONS OF NARCOTIC LAWS

The Board went on record as opposing Bill H. R. 16874, deprecating the use of espionage in the detection of narcotic addiction.

AFFILIATION WITH ASSOCIATION PROFESSIONNELE INTERNATIONALE DES MÉDECINS

The Board decided to accept the invitation of Dr. Decourt, secretary of the Association professionnele internationale des médecins, to affiliate with that society, for the purpose of collating information on subjects having to do directly or indirectly with medicine, such as national health insurance; the constitution and general position of organizations dealing with medical politics and defense throughout the world; possible methods of cooperation between the A. P. I. M. and the International Labor Office at Geneva; laws regulating medical practice, qualified and unqualified, throughout the countries covered by the A. P. I. M.; laws and customs regulating the practice of medical specialties, and pharmaceutic services and freedom of prescription in connection with organized medical services.

REPRESENTATIVE TO MEETING OF BRITISH MEDICAL ASSOCIATION AND THE ROYAL INSTITUTE OF PUBLIC HEALTH

Invitations to the Association to send representatives to the meeting of the British Medical Association, to be held at Manchester, July 23-26, 1929, and to the Congress of the Royal Institute of Public Health, to be held in Zurich, May 15-20, 1929, were accepted.

VISUAL AND MOVING PICTURE EDUCATION

A plan for the production of medical scenarios and medical films was approved by the Board and referred to the Committee on Visual Education.

INVESTIGATION OF ACCIDENTS DUE TO ANESTHETICS

A request for the appointment of a committee to investigate accidents due to anesthetics was referred to the Council on Scientific Assembly.

MISCELLANEOUS

Appropriations were made for the conduct of the work of the various departments, councils and bureaus as well as for the committees on scientific and therapeutic research, and for the Committee for the Protection of Medical Research, and other routine business was transacted.

THE PORTLAND SESSION

Special Train for Orthopedic Surgeons, with Entertainment en Route

In response to many invitations received from orthopedic surgeons of the West, the Section on Orthopedic Surgery is organizing a party to occupy a special train on the Chicago, Milwaukee, St. Paul and Pacific Railroad, leaving Chicago Union Station at 11:30 p. m., July 2, and St. Paul at 11 a. m., July 3, stopping at Spokane, Tacoma and Seattle, where the party will be the guests of the local orthopedic surgeons, and arriving at Portland in plenty of time for the annual session. Reservations can be secured from any agent of the Chicago, Milwaukee, St. Paul and Pacific Railroad.

Meeting Halls and Special Transportation Facilities

The convenient location of the meeting halls in Portland to be utilized by the Association at the coming session will enable visiting Fellows to see the various attractions with a maximum of comfort and convenience.

All the activities of the convention will be conducted in three buildings in the heart of the down-town district within a radius of a half mile. The headquarters of the House of Delegates will be at the Hotel Multnomah, where 250 rooms have been reserved for the delegates and officers of the Association.

Registration headquarters and the scientific and technical exhibits will be housed in the Municipal Auditorium. Most of the section meetings will be held in the recently completed Masonic Temple, which is one of the finest buildings of its kind in the country and admirably adapted for the section meetings.

Portland's medical center, consisting of the University of Oregon Medical School, Doernbecher Memorial Hospital, Multnomah County Hospital, and the new Veterans' Bureau Hospital, is only a few minutes' drive from the various convention headquarters, so that visitors will be able to reach the various institutions with little effort.

Negotiations are under way with one of the large taxicab companies to make available its fleet of cabs for the use of visiting Fellows. A uniform nominal charge will be in effect between any two points in the convention area. Tickets will be provided and will be on sale at all the leading hotels.

Exhibit by Section on Diseases of Children in the Scientific Exhibit

The Section on Diseases of Children will be represented for the second time in the Scientific Exhibit at the Portland Session. The exhibit proposed for this session is on the same topics as last year, in view of the fact that last year's exhibit was so favorably received. The topics are: (*a*) The Effects of Vitamins as Applied to Infant Feeding; and (*b*) Milk and Its Modifications. It is the purpose to make the exhibit of interest and value to the profession at large, as well as to the members of the section. The members of the specialty are requested to take an inventory of the materials which might illustrate phases of these subjects and communicate with the chairman of the committee, Dr. L. Howard Smith, 734 Medical Arts Building, Portland, Ore. All applications must be made on the regular application form, which is the one required by the A. M. A. Committee on Scientific Exhibit. These may be obtained either from the chairman of the section exhibit, Dr. Smith, or from Director, Scientific Exhibit, 535 North Dearborn Street, Chicago. Applications should be filed not later than April 1, with Dr. Smith. The complete personnel of the Committee on Section Exhibit of the Section on Diseases of Children will be announced in a forthcoming issue.

MEMBER OF COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

Dr. James S. McLester of Birmingham, Ala., has been appointed by President Thayer to serve as a member of the Council on Medical Education and Hospitals until the next meeting of the House of Delegates of the American Medical Association. Dr. McLester was appointed to succeed Dr. S. W. Welch, deceased.

MEDICAL BROADCAST FOR THE WEEK

The American Medical Association Morning Health Talks and Evening Health Hints from Hygeia

The American Medical Association broadcasts daily at 10 o'clock in the morning, central standard time, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of March 11 to 16 will be as follows:

March 11. "Teaching Children How to Like Proper Food," by Dr. R. G. Leland.
March 12. "Teaching Children How to Like Proper Food," (continued), by Dr. R. G. Leland.
March 13. "Medical Mail Order Frauds," by Dr. Arthur J. Cramp.
March 14. "Medical News," by Dr. J. F. Hammond.
March 15. "Evolution of Quackery," by Dr. Morris Fishbein.
March 16. "Evolution of Quackery" (continued), by Dr. Morris Fishbein.

Evening Health Hints from Hygeia at 8 o'Clock, Central Standard Time

March 11. Throbbing in the Ears.
March 12. Facts About Heart Disease.
March 13. Enlarged Glands in Children.
March 14. Removing Birthmarks.
March 15. Seasickness.
March 16. Tourist Camps.

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Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Society News.—Dr. John J. Shea, Memphis, Tenn., addressed the Calhoun County Medical Society, February 12, on "Normal Functions of the Paranasal Sinuses" and Dr. Hugh E. Gray, Anniston, on "Progressive Muscular Dystrophy."——Dr. John G. Wishard, Wooster, Ohio, addressed the Mobile County Medical Society, February 2, on "Newer Methods of Treating Incipient Cataract."——The Jerome Cochran lecture, so-called in honor of Alabama's first health officer, will be delivered during the annual meeting of the Medical Association of Alabama in Mobile, April 16-19, by Dr. Louis B. Wilson, Mayo Foundation, Rochester, Minn.

ARIZONA

Bill Enacted.—Senate bill 8, creating a board of orthodontia examiners to consist of the board of dental examiners and two practicing orthodontists, has become a law.

Bills Passed.—House bill 95, prohibiting the use of the name drug store or kindred names for places in which a registered pharmacist is not employed, has been passed by the house. Senate bill 34, providing for the sexual sterilization of inmates of the state hospital for the insane, has been passed by the senate.

State Health Officer Appointed.—Governor Phillips announced, February 16, the appointment of Dr. Reginald J. H. Stroud, Tempe, as state superintendent of public health to succeed Dr. Frederic T. Fahlen, whose term expires April 2. The governor also announced the appointment of Drs. Harlan P. Mills, Phoenix, and O. S. Brown, Winslow, as members of the state medical board, succeeding Drs. William O. Sweek, Phoenix, and William F. Chenoweth, Nogales, respectively, whose terms have expired.

CALIFORNIA

Dr. Halliday Goes to Maryland.—Dr. Charles H. Halliday, for several years chief epidemiologist of the California State Department of Health, has been appointed deputy state health officer for Anne Arundel County, Maryland, and will act as epidemiologist of the department. Dr. Halliday, who formerly lived in Baltimore, served also with the Minnesota State Department of Health, in the Philippines, and during the World War with the American Expeditionary Forces; after the war, he was in Poland engaged in typhus fever control work.

Physicians in the Cabinet.—The secretary of the interior in President Hoover's cabinet is Dr. Ray Lyman Wilbur, who graduated from Stanford University in 1896 and from Cooper Medical College, San Francisco, in 1899. After a period of graduate study in England and Germany he became a teacher at his alma mater and served through various grades on the faculty. Dr. Wilbur became dean of Stanford University School of Medicine in 1911, and since 1916 has been president of Stanford University. He has not only been a practitioner and teacher of medicine but has taken an active part in medical organization. He served in the House of Delegates in 1914 and 1915 and was President of the American Medical Association in 1923. He is chairman of the Council on Medical Education and Hospitals and chairman of the Committee on the Cost of Medical Care. Dr. Wilbur has served the public in other capacities, having been president of the California State Conference of Social Agencies, vice president of the San Francisco Community Chest, a member of the State Park Commission of California, trustee of the Rockefeller Foundation, and chairman of the Institute of Pacific Relations. The secretary of the interior during most of the administration of President Coolidge was Dr. Hubert Work of Colorado Springs, who resigned from the cabinet in 1928 to become chairman of the National Republican Committee. Dr. Work also practiced medicine and was a member of the House of Delegates of the American Medical Association for many years. He was the first speaker of the House of Delegates and was President of the Association in 1921.

CONNECTICUT

Society News.—The first number of the *Yale Journal of Biology and Medicine*, sponsored by the students in medicine and the biologic sciences at Yale, was published in October.——At the annual meeting of the Connecticut Public Health Association, New Haven, January 30, Dr. Stanley H. Osborn, state health commissioner, spoke on "Health Legislation Which Is Before the Present General Assembly."

Seventh Annual Health Institute.—The state department of health announces that Connecticut will be host to the seventh annual New England Health Institute, which meets at Hartford, April 22-26. This is a school of public health. Three lectures are given simultaneously each hour during the meeting, making a total of eighty-one. The faculty will be composed largely of members of the Yale and Harvard medical schools, secretaries of several state health departments, members of the U. S. Public Health Service and other persons connected with national health organizations. Fourteen different courses will be given, including health administration, preventable diseases, child hygiene, laboratory, vital statistics and public health nursing. All lectures will be held at the Hotel Bond.

Bills Introduced.—House bill 830 apparently creates a way by which osteopaths may obtain the right to prescribe drugs and perform surgical operations. It would require the medical examining committee to accept osteopathic applicants for the regular medical examinations. Senate bill 459 provides that all actions against physicians, surgeons, dentists, hospitals and sanatoriums for malpractice, error, mistake or failure to cure, whether based on contract or tort, must be brought within one year from the date of the injury or the neglect complained of. Senate bill 479 requires osteopaths to register annually. House bill 695 prohibits the carrying of any poisonous substances in an airplane, unless the airplane is equipped with an effective device to prevent the dropping or depositing of the poisonous substance. House bill 867 amends the law relating to dentists by permitting dentists who practiced in this state prior to Oct. 1, 1907, to practice without a license. House bill 868 provides that the state board of health shall pay to physicians 25 cents for each report filed in accordance with chapter 164 of the public acts of 1927, concerning reports of contagious diseases.

DELAWARE

Bills Introduced.—Senate bill 102 authorizes the state board of examiners of graduate nurses to formulate and establish a curriculum and rules for training schools. Senate bill 147 creates a commission to investigate the extent to which, and the conditions under which, intoxicating liquors are manufactured and sold and narcotic drugs are vended contrary to law. House bill 271 amends the law relating to the board of health by providing for an additional member of the board, who shall be a doctor of dental surgery. House bill 303 amends the state prohibition law by providing that a druggist may lawfully dispense and any one may lawfully possess medicinal liquor if such dispensing or possession is in compliance with the provisions of the Volstead Act.

GEORGIA

Personal.—Dr. Gordon T. Crozier, Valdosta, health commissioner of Lowndes County, has been elected president of the Georgia Health Officers' Association for the ensuing year, and Dr. Victor H. Bassett, Savannah, secretary, reelected.——The Georgia Hospital Association was organized at a meeting, February 6, in Macon and Dr. Joe R. Clemmons, superintendent of the Macon Hospital, was elected president.

Historic Characters of Medicine.—A unique method of promoting interest in the history of medicine was featured recently at the annual meeting of the Fulton County Medical Society in Atlanta. Eleven outstanding men were portrayed by eleven members of the society, each dressed in the attire of the man represented. The historic characters portrayed are shown in the picture on the opposite page, and from left to right are Hippocrates, Claudius Galen, William Harvey, John Hunter, Edward Jenner, Laënnec, Crawford W. Long, Rudolph Virchow, Louis Pasteur, Joseph Lister and Robert Koch. Each one came back, as it were, and gave a ten minute talk about his work. Nothing else in the local society is said to have been as highly appreciated. Dr. Frank K. Boland was chairman of the committee on arrangements.

ILLINOIS

Society News.—The Lake County Medical Society was host, February 13, at the Victory Memorial Hospital, Waukegan, to the Kenosha County (Wis.) Medical Society and the staffs of the U. S. Naval Hospital at Great Lakes, the U. S. Army Hospital at Fort Sheridan, and the veterans' bureau hospital at North Chicago. The scientific program was a symposium on bronchial asthma, the speakers being Drs. Burton D. Haseltine, Alvin W. LaForge and Ralph Kuhns, all of Chicago; Dean W. Myers, Ann Arbor, Mich., and Herman T. Schlegel, Wausau, Wis. Dr. Theodore S. Proxmire, Lake Forest, president of the Lake County Medical Society, presided.

Bills Introduced.—House bill 190 provides that the board of medical examiners appointed by the department of registration for the examination of applicants to practice the healing art shall consist of "five persons, all of whom shall be reputable physicians licensed to practice medicine and surgery in this state, no one of whom shall be an officer, trustee, instructor or stockholder in any medical college which confers upon its graduates the degree of doctor of medicine." The present act reads "any medical college or medical institution," which a court decision construed to include any hospital in which systematic instruction is given and thus barred from the examining board any member of the staff of such a hospital. House bill 251 provides for the sexual sterilization of inmates of state institutions when it is for the best interest of the patient and of society.

Chicago

Personal.—Dr. Antonio Lagorio, director of the Chicago Pasteur institute, completed his fiftieth year in practice, February 25, having graduated from Rush Medical College in 1879.——Dr. William J. Quigley has resigned as assistant clinical professor of medicine in Rush Medical College of the University of Chicago and Dr. Arthur L. Tatum as associate professor of pharmacology.

Chicago's Smoke.—The department of health estimates that the excessive laundry bills due to smoke in the atmosphere of Chicago and the injuries to fabrics, buildings and metal by atmospheric gases cost each inhabitant from $10 to $15 a year, and that the total cost of the damage by smoke, together with the loss of heat units through improper firing is $43,500,000. This does not include the cost of sickness and ill health. About 35,000,000 tons of coal are said to be consumed in Chicago a year, 5 per cent of which is lost through smoking chimneys. The health department has published a bulletin on the smoke problem, in which the effects of smoke on health are discussed.

Society News.—Dr. John W. Wilce, until recently and for many years coach of the Ohio State University football team, gave an address, February 21, on "Sport and the Professional Man" at the West Side Professional Schools, Y. M. C. A., 1804 West Congress Street.——The Chicago Council of Medical Women was addressed, March 1, by Dr. Theodora Wheeler, Rochester, Minn., on "Finesse in Medical Hygiene."——The names of the following members of the executive committee of the League for the Prevention of Hay Fever were inadvertently omitted from the item in THE JOURNAL, February 23, page 655, because they had not yet been received: Drs. Harry L. Huber, Samuel M. Feinberg and Lena K. Sadler.——The Oak Park Physicians' Club and the Aux Plaines branch of the Chicago Medical Society will sponsor jointly a "goiter day," April 24, when Dr. Frank H. Lahey, Boston, will hold a clinic at the West Suburban Hospital, speak at a luncheon and give a public address at the high school. At the joint meeting of the branch with the central society, Dr. Fred H. Albee, New York, will speak on "Automatic Machinery in Bone Surgery."——At a conference of the Chicago Association for Child Study and Parent Education at the Palmer House, March 9, among others, Ernest R. Groves, research professor of sociology, University of North Carolina, will speak on "The Social Ordeal of the Adolescent: The Social Life."

INDIANA

Bills Introduced.—House bill 314 authorizes utilities, or any city or town operating a utility, to furnish utility service free of charge to hospitals which accept and care for charity patients. House bill 430 prohibits the possession, except by a registered pharmacist or by reason of lawful prescription, of cannabis sativa and indica.

Bills Passed.—House bill 177, requiring three years' experience and eighteen months' schooling for registered assistant pharmacists, has been passed by the house. The house has passed the following bills: House bill 176, establishing the latest revisions of the United States Pharmacopeia and National Formulary as the Indiana standards of purity and strength of drugs, chemicals and medicines. House bill 189, amending the law concerning insanity inquests so as to allow medical examiners 10 cents a mile for attending hearings or making examinations.

IOWA

Bills Passed.—House bill 96, providing for the suspension of the licenses of physicians and pharmacists who have been convicted of a violation of the federal statutes and regulations relating to intoxicating liquors or to narcotics, has been passed by the house and the senate. Senate bill 106, providing for the treatment and care of patients who have been committed to the hospital of the University of Iowa College of Medicine, has been passed by the senate.

Bills Introduced.—Senate bill 277 amends the law relating to the appointment of the local registrar of vital statistics by providing that such appointments shall be made by the local boards of health in cities having a population of 50,000 or more. Senate bill 286 prohibits the vending of drugs or medicines without the obtaining of a license from the board of pharmacy examiners. Senate bill 316 provides that the employer may be liable for medical and surgical services to an injured employee to an amount not exceeding $200 and for hospital services in an amount not exceeding $500, and that all fees and charges for such medical and hospital services shall be subject to the approval of the industrial commissioner. Senate bill 333 provides that in juvenile homes in cities having a population of 125,000 or more, a psychiatrist may be employed or the services of a psychiatric unit or agency may be utilized.

KANSAS

Bills Passed.—The house has passed the following bills: House bill 4, amending the medical practice act in regard to the subjects included in the examinations required of applicants and house bill 162, providing for the examination and registration of pharmacists.

Bills Introduced.—House bill 241 authorizes counties to levy a tax, not in excess of one-half mill on the dollar of assessed valuation of all taxable property, for assisting in carrying out health laws, and providing a county health fund within the county and the payment of the salary of the county health officer. Senate bill 379 requires every person authorized to act as an obstetrician to instil into the eyes of an infant immediately on its birth a prophylactic solution approved by the state board of health. House bill 401 provides that in every county having a population of not less than 130,000, the coroner may appoint two deputies.

Extension Courses.—The University of Kansas School of Medicine and the extension division of the university have been giving short intensive medical courses for practitioners since September. The next one will be in urology from March 25 to March 31; the instructors will be Drs. William F. Braasch and Hermon C. Bumpus, Jr., of the Mayo Clinic, Rochester, Minn., and Dr. Dalton K. Rose, Washington University School of Medicine, St. Louis. A course for general practitioners in eye, ear, nose and throat work has been arranged but no date set. It will be given in response to requests from practitioners who desire training in giving minor treatments in their offices. The special courses were given at Bell Memorial Hospital, Kansas City. There was a fee of $30 to make the work self-support-

ing. The courses completed comprised physical therapy, internal diagnosis, surgical diagnosis, obstetrics and gynecology and pediatrics; the instructors were well known men from other states.

KENTUCKY

Physician Injured When His Horse Falls.—Dr. Lonnie L. Wright of Boaz, near Maysville, broke his leg, February 22, when his horse slipped in the snow and fell. Dr. Wright was making calls on his patients when the accident occurred.

Centre College and County Society Honor McDowell.—The Boyle County Medical Society and Centre College sponsored jointly a public meeting at Danville, March 1, in honor of the late Dr. Ephraim McDowell of that city, who performed the first ovariotomy. The meeting afforded residents of that community an opportunity to join in a national tribute to a native son previous to the exercises in the Capitol at Washington, where his statue was to be unveiled. The meeting was held in the chapel of Centre College, the president, Charles J. Turck, presiding; the speakers were Dr. Granville S. Hanes, Louisville; Dr. John H. Blackburn, Bowling Green, president of the state medical association, and Judge Samuel Wilson, Lexington. Ephraim McDowell was one of the founders of Centre College and a member of its first board of trustees.

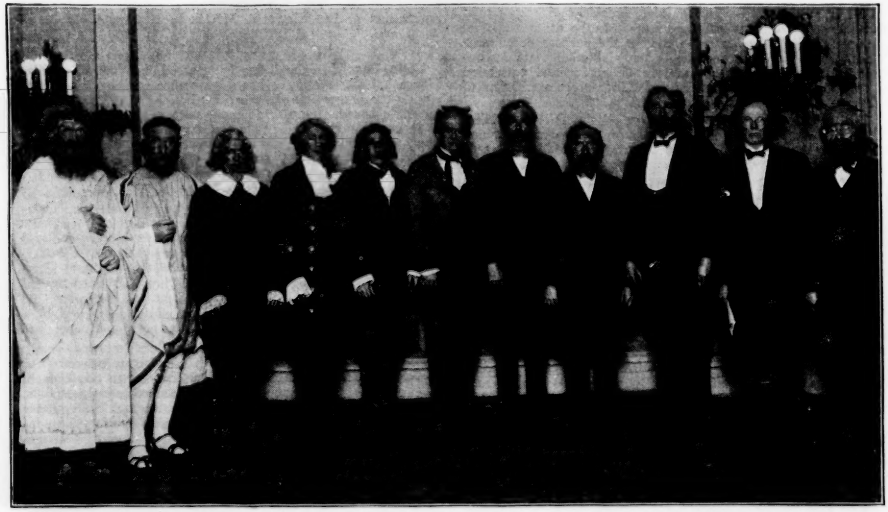
Society News.—The McCracken County Medical Society, Paducah, recently presented to Dr. James T. Reddick a traveling bag and fountain pen in appreciation of his seven years' service as secretary of the society.——Knox and Whitley counties recently organized a joint health district and placed Dr. Martin W. Steele in charge with headquarters at Corbin. There will be three nurses (one each at Corbin, Barbourville and Williamsburg) and a sanitary inspector.——Dr. Joseph A. Stucky, Lexington, addressed the Harlem Medical Association, New York, January 22, on "Our Mountain Locked Anglo-Saxons in Eastern Kentucky and Some of Their Problems."——The Daviess County Medical Society, Georgianna, was addressed, January 8, by Dr. James H. Thorpe on "Eye Symptoms as Related to Other Physical Conditions."——Dr. William Allen Pusey, Chicago, addressed the Innominate Society at a dinner at the Hotel Seelbach, Louisville, Dec. 28, 1928, on the life of the medical man. The president of the society, Dr. Henry G. Barbour, presided.——The state board of health will broadcast over station WHAS, Louisville, on Tuesday afternoons, at 5 o'clock. The talk on February 26 was by Dr. Lillian H. South on "Avenues of Germ Infections." The February 5 talk was by Dr. Paul A. Turner on "Winter Care of Tuberculosis."

MAINE

Bills Introduced.—House bill 434 provides that every teacher must file a certificate from a practicing physician showing that she is free from infectious and communicable diseases. House bill 433 enlarges the powers of public health boards by providing that in case of emergency or threatened epidemic which may effect more than one city, the state department of health, if it shall appear to it necessary and proper, may make such temporary orders and regulations as in the opinion of its members the public emergency may require.

MARYLAND

Dr. Minot Gives the Thayer Lectures.—The second course of the William Sidney Thayer and Susan Read Thayer Lectureship in clinical medicine was given at Johns Hopkins University School of Medicine, Baltimore, March 7-8, by Dr. George R. Minot, professor of medicine, Harvard University Medical School, and director of the Thorndike Memorial Laboratory, on "Treatment of Pernicious Anemia" and "Treatment of Anemia Other Than Pernicious Anemia Particularly with Diet and Iron." The 1928 lecturer on this foundation was Sir Humphry Rolleston. A group of friends of Dr. William S. Thayer donated a fund to the university in 1927 to endow the lectureship.



Historic characters in medicine, impersonated by members of the Fulton County (Ga.) Medical Society.

MASSACHUSETTS

Bill Introduced.—House bill 1029 authorizes the city of Quincy to borrow money for hospital purposes.

Bills Passed.—House bill 202, providing that no unvaccinated child under 14 years may be admitted to any private or public school unless he shows a certificate from a physician that his health would be endangered by vaccination, has been passed by the house and the senate. The following bills have been passed by the house and the senate: Senate bill 224, providing for an annual registration fee of $2 for dentists and for publication annually by the board of registered dentists. House bill 456, providing for the erection and maintenance of a health department building within the limits of the Back Bay Fens in the city of Boston. House bill 732, authorizing the town of Danvers to maintain a public hospital for the use of the inhabitants. House bill 1047, authorizing the city of Cambridge to incur indebtedness for the erection of an addition to the Cambridge City Hospital.

Occupational Therapy Centers Suggested.—There is a small home at Hopkinton which was established to act as a

stepping-stone from the state hospitals back to society for mental patients who are on the road to recovery. It is the only place in the state to which patients from mental hospitals can be sent when it is believed that their recovery will be hastened by removing them from an institution to a homelike environment. For years, the state board of insanity endeavored to have the legislature appropriate money for such an institution without avail. Dr. Ermy C. Noble, assistant superintendent, Boston State Hospital, finally gave his farm in Hopkinton at a nominal rental, and an appeal was made to private subscribers for funds to establish the so-called occupational therapy center. The present home accommodates about ten patients and is entirely free of institutional surroundings, the women patients being treated like members of one family. Although the center has been in operation several years, the aim still is to keep it small. The work accomplished here in receiving patients depressed to the point where they wonder whether they will ever be useful again, and returning them to their homes improved, suggests that a number of similar institutions might be included with great advantage in the state hospital system.

MICHIGAN

Bills Introduced.—Senate Joint Resolution 6 proposes an amendment to the constitution of the state so as to authorize the state to borrow money to use for the purpose of building hospitals and asylums for the insane and other state institutions. House bill 96 regulates the dispensing and possession of narcotics and provides for isolation and rehabilitation of narcotic addicts.

Bills Passed.—The house has passed the following bills: House bill 22, creating a board of chiropractic examiners and regulating the practice of chiropractic, and house bill 26, amending the law prohibiting any person sick with a communicable disease from being brought into any part of Michigan without the special permit of the board of health by providing that any county may transport persons to and from county hospitals and sanatoriums without the special permit of the board of health.

MINNESOTA

Bills Introduced.—Senate bill 399 creates a board of barber examiners and regulates the practice of barbering. Senate bill 420 provides for the construction and maintenance of a psychopathic hospital at the state university. Senate bill 588 regulates the practice of hairdressers and beauty culturists. House bill 517 provides that any hospital supported or maintained solely or partly by public funds shall make no distinction between the various schools of medicine. House bill 604 amends that portion of the workmen's compensation act relating to occupational diseases by including as occupational diseases (1) poisoning by carbon monoxide acquired in the handling of motor vehicles, and (2) dermatitis acquired in any process involving the use or mixture of paints.

MISSOURI

Bill Introduced.—Senate bill 615 would permit osteopathic physicians to employ narcotics in the practice of their profession.

Pastor Sentenced for Practicing Medicine.—The St. Louis *Globe-Democrat* reports that Rev. Edward Barber, a negro, 1115 O'Fallon Street, St. Louis, was sentenced to six months in the workhouse, February 6, by Judge Butler for practicing medicine without a license. A patient testified that Reverend Barber had treated her since last August for a tumor by means of salves and herbs which she purchased from him.

Four Get Into Missouri Through Arkansas.—On January 2, the Missouri State Board of Health licensed four graduates of the defunct Kansas City College of Medicine and Surgery to practice medicine in Missouri. According to the St. Louis *Star* (the newspaper that assisted in the diploma mill investigation a few years ago), they were:

Louis C. Schneider, Kansas City, who was indicted by federal grand jury last April on six counts alleging violation of the Harrison Narcotic Law. Schneider aided the government in the preparation of other narcotic cases, and the treasury department agreed to a compromise by which he will pay a $250 fine.
E. C. Teubel, Kansas City.
B. T. Colglazier, Kansas City.
Verna S. Kenney of Joplin and Rocky Comfort. Kenney attempted to pass the Missouri Board twice previously and failed; recently Attorney General Shartel appeared to have interceded in his behalf.

Schneider, Teubel and Colglazier are said to have been licensed because of their testimony several months ago against Dr. Ray B. Horton (THE JOURNAL, June 18, 1927, p. 1973) to whom they are said to have paid money to get them by the examining board in 1923. The four were licensed in Arkansas by the Eclectic Examining Board of that state, and through reciprocity their licenses to practice in Missouri were issued. The Missouri State Board of Health had ruled against granting reciprocity to the Arkansas board, but its rule seems to have been set aside, at least temporarily. The Missouri board did not recognize the Kansas City College of Medicine and Surgery last July when another man requested a license through reciprocity and the board announced then the policy of not endorsing any physician who graduated from a school not recognized by the board. It appears in health department records, the *Star* says, that Kenney formerly practiced at Bethpage, Mo., without a license. Last April, when the Missouri state board of health denied application for a license to Kenney, it unanimously resolved to adhere rigidly to the new medical practice act which requires that all persons appearing for examination for license shall furnish evidence of having attended at least four terms of a reputable medical school. The members of the Missouri State Board of Health are Drs. William A. Clark, Jefferson City, president; Homer L. Kerr, Crane, vice president; James Stewart, Jefferson City, secretary, and Herman S. Gove, Linn, Willard Bartlett, St. Louis, and Herbert A. Breyfogle, Kansas City, all of whose terms will expire, September 23. There is one vacancy caused by the recent resignation of Dr. Elmer T. McGaugh, Richmond.

MONTANA

Bills Passed.—The house has passed the following bills: House bill 82, creating a board of barber examiners and regulating the occupation of barbering; house bill 107, authorizing the state board of health to make such rules and regulations as it deems necessary for the sanitary provisions of tourists' camp grounds; house bill 126, creating the Montana State Examining Board of Beauty Culturists and regulating the occupation of hairdressers and cosmetologists.

Society News.—The officers and legislative committee of the state medical society met, January 20, to consider legislation before the present legislature. It was decided to ask the attorney general to undertake to prosecute certain alleged illegal practitioners in the state.——At a recent meeting of the Yellowstone Valley Medical Society, four of the six state legislators were guests. This society will hold its third annual clinical conference at Billings, April 4, at the Deaconess and St. Vincent's hospitals. In addition to clinics there will be a motion picture film and four scientific papers, a banquet and a smoker. All physicians are cordially invited.

Bills Introduced.—Senate bill 133 makes it unlawful for any person other than a registered pharmacist to retail, vend, compound or dispense drugs or medicine excepting hospitals, which may acquire drugs and medicines for use by regularly licensed physicians, when such articles are kept in charge of the medical staff of said hospital and dispensed on the written orders of physicians. This apparently would prohibit a physician from dispensing drugs and medicines in his private practice. House bill 209 declares that hereafter all contracts or agreements for the performance of personal services in connection with the preparation for burial or cremation, or with the burial or cremation, of dead human bodies, made prior to the death of the persons whose bodies are to be buried or cremated, when the contract or agreement is not made in contemplation of imminent death, are against the public policy of the state. House bill 311 provides for the construction of a hospital building at the Montana state tuberculosis sanatorium. House bill 314 makes an appropriation for the construction, furnishing and equipping of a house for the criminal insane, of living quarters for the attending physicians, and of an addition to the heating plant at the Montana state hospital for the insane.

NEBRASKA

Bill Introduced.—House bill 394 provides that in any civil and criminal trial the judge may appoint one or more qualified medical experts to investigate and testify.

Bills Passed.—Senate bill 162, providing for the acceptance of certificates of those passing the National Board of Dental Examiners in lieu of an examination before the Nebraska State Board of Dental Examiners, has been passed by the senate. The following bills have been passed by the house: House bill 44, providing that a member of the board of examiners in nursing shall not be disqualified because he is an official or member of the instructional staff of any school in which any profession is taught; house bill 394, providing that the court may appoint an expert on motion of either party or its own motion to investigate and give expert medical testimony at trials in civil and criminal cases.

NEVADA

Bill Passed.—Senate bill 9, providing that any county may establish a public hospital, levy a tax and issue bonds therefor, has been passed by the senate.

NEW HAMPSHIRE

Bill Passed.—The senate and the house have passed house bill 3, amending the law relating to purity and branding of foods and drugs by including substances to be used for toilet purposes within the provisions of the act.

NEW JERSEY

Bills Introduced.—House bill 257 amends the law regulating the practice of midwifery by providing that the board may suspend any licenses. House bill 270 amends the law regulating the practice of dentistry by providing that any applicant for a license to practice dentistry who has been prevented from attending or completing the examination may be given a further or subsequent examination under the original application on the payment of an additional fee of $10.

NEW MEXICO

Bill Introduced.—House bill 184 amends the law relating to registered pharmacists by providing that any person who has practiced medicine for ten years in New Mexico shall be entitled to a license as a registered pharmacist without examination.

NEW YORK

Bills Passed.—House bill 174 and senate bill 90, amending the mental hygiene law by defining a "resident" as one living within the state one year continuously, have been passed by the house and the senate. The following bills have passed the house: House bill 459, providing that a tuberculous poor person shall not be deemed settled in any town in Green County until he has lived there five years, and house bill 596, eliminating from the duties of health officers the duty of examining school children.

Bills Introduced.—Senate bill 891 provides for a psychiatric clinic at Sing Sing prison for the scientific study of each criminal, with recommendations for the care, training and employment of criminals. House bill 1193 provides that all boxers and wrestlers licensed by the boxing commission must submit themselves to a physical and medical examination by a licensed physician at least once in each three months. Senate bill 323 amends the general business law in relation to the licensing of employment agencies by excepting from its provisions duly incorporated alumnae associations of registered nurses.

Health at Yonkers.—Telegraphic reports to the U. S. Department of Commerce from sixty-four cities with a total population of about 30 million, for the week ending February 16, indicate that the lowest mortality rate (6.5) was for Yonkers, and that the mortality rate for the group of cities as a whole was 15.3. The mortality rate for Yonkers for the corresponding week last year was 12.1, and for the group of cities, 14. The highest infant mortality rate (159) for the week ending February 16 was for Schenectady and the lowest (17) for Camden, N. J. Caution should be used in the interpretation of weekly figures, as they fluctuate widely. The facts that some cities are hospital centers for large areas outside the city limits or that they have a large negro population may tend to increase the death rate.

Society News.—The Eastman Kodak Company, Rochester, gave free courses in February for roentgen-ray technicians employed by physicians or recognized hospitals. There were lectures by experts from the medical division of the company and from the faculty of the medical school of the University of Rochester, practical demonstrations, and inspections of the film manufacturing plant; later a course will be arranged entirely on medical photography.——The Hospital Association of the State of New York will hold its annual meeting at Rochester, May 16-17.——The fourth New York Health Conference will be held at the Hotels Roosevelt and Biltmore, March 14-15, under the auspices of seven different state, local and national agencies. Among the speakers will be Surgeon General Cumming, U. S. Public Health Service, Dr. William H. Welch, Baltimore, Prof. Charles-Edward A. Winslow, Dr.P.H., New Haven, and Drs. Matthias Nicoll, Jr., and Shirley W. Wynne.

New York City

What the Health Department Offers Physicians.—The city department of health reminds physicians of some measures which it has inaugurated in the last fifty years, always keeping in mind that one of its functions is to assist physicians. Some activities have been inaugurated which the medical profession regards as an invasion, but they have not been established, the department states, where private practitioners would supply the necessary service. It is hoped that much work will gradually be taken over by private physicians, so that the department may devote its attention to other health problems. Some measures inaugurated by the department are:

1. In 1874, established a laboratory for production of smallpox vaccine.
2. In 1892, established a bacteriologic laboratory to aid physicians in diagnosing cholera.
3. In 1893, established stations in drug stores where physicians could leave throat specimens to be examined by the department's laboratory.
4. In 1894, offered to examine sputum for tubercle bacilli.
5. In 1895, established municipal antitoxin laboratory and made diphtheria antitoxin available.
6. In 1898, offered to assist physicians in diagnosing typhoid by means of the Widal test.
7. In 1902, began examining smears for malaria parasites.
8. In 1905, assisted physicians in diagnosing cerebrospinal meningitis by examination of the spinal fluid. Also in 1905, instructions given to physicians in the diagnosis and treatment of tuberculosis.
9. In 1906, the Otisville Sanatorium was established where physicians could send patients for treatment at the expense of the city.
10. In 1908, school medical inspection work was reorganized and children with physical defects were referred to physicians for treatment.
11. In 1912, began making Wassermann tests free for physicians and in the same year organized a group of experts to assist physicians in diagnosis and treatment of meningitis. Also in 1912, the department began the publication of its weekly bulletin for the information of physicians.
12. In 1915, inaugurated the examination of food handlers and requested practitioners to cooperate. Also adopted the law requiring a physician's certificate of health for children entering school for the first time.
13. In 1916, inaugurated bedside courses of instruction for physicians in diagnosis and treatment of contagious diseases.

NORTH CAROLINA

Bills Passed.—The house has passed the following bills: House bill 246, regulating the practice of barbering in the state, and house bill 769, authorizing the town council of the town of Morganton to call an election for the issuance of bonds for the erection of Grace Hospital, Inc.

Bills Introduced.—House bill 785 provides that a license to practice medicine may be revoked because of fraud or material misrepresentation used in the application or in obtaining the license to practice. Senate bill 594 places on the state board of health the duty of supervising and inspecting the state institutions for the insane and feebleminded.

NORTH DAKOTA

Bills Passed.—The senate has passed the following bills: Senate bill 102, amending the dental law so as to permit dental students and physicians to work on teeth, and senate bill 125, providing for the examination, approval and registration of camps by the state health department.

Bill Introduced.—Senate bill 75 establishes a division of child hygiene and public health nursing and appropriates to supply a deficiency in funds for the operation thereof caused by the discontinuance of federal aid granted during the past seven years under the provisions of the Sheppard-Towner Act for Maternity and Infancy Hygiene.

OHIO

Bills Introduced.—House bill 179 provides for the sexual sterilization of certain classes of feebleminded, epileptic persons before their release from any public institution, or of such persons when duly adjudged for commitment to such institutions. House bill 236 amends the law relative to pharmacy by eliminating examinations for assistant pharmacists.

Clubs for Physicians.—A Camera Club and a Literary Club are being sponsored by the Toledo Academy of Medicine as adjuncts to scientific activities and as avocations. Many Toledo physicians already have movie cameras which they use in medical work and in leisure hours. The Camera Club, organized, February 26, in the academy's building, will aid these members through group study, exchange of experiences and special courses of lectures. The Literary Club has been active for two years and its example has been followed in other states and cities. As a result of its work, many releases of medical copy have been given to the press and many physicians in Toledo have been assisted in writing scientific material. The Literary Club of the Toledo Academy of Medicine is to increase its scope by importing professors and scholars of English for lecture work.

OREGON

Bills Passed.—The house has passed the following bills: House bill 364, providing that permanent insanity shall be a cause for divorce; house bill 386, amending the law relating to the examination and registration of registered nurses by providing for the granting of certificates by reciprocity, the annual registration of nurses' certificates and the payment of an annual license fee; house bill 396, exempting chiropodists from jury service.

Bills Enacted.—Senate bill 108, providing that the money received as fees by the state board of medical examiners be divided in the following manner: 10 per cent to be subject to appropriation for general state purposes; 40 per cent to be paid over to the University of Oregon Medical School, and the balance to be used by the board of medical examiners for the payment of the necessary expenses incurred by said board. House bill 249, requiring indication on the container showing date and manufacture of poison sprays, has become a law.

Gift for University Clinic.—The dean of the University of Oregon Medical School, Dr. Richard B. Dillehunt, announced, February 9, that the Rockefeller Foundation had given $400,000 to the medical school, $300,000 of which will be used to construct a new clinic building on Marquam Hill, Portland, and the remainder for equipment. The building will house the Free Dispensary which, during last year, accommodated about 14,000 persons who were unable to pay for treatment. This is the largest gift ever made to the medical school, although the total of gifts during the last ten years is about $1,225,000. The present accommodations for the clinic have been outgrown. The new building will also provide classrooms and an assembly hall for medical meetings. More than 100 well known physicians serve on the staff of the Portland Free Clinic without salary.

Bills Introduced.—Senate bill 201 provides for the licensing by the state board of health of swimming pools, public bathhouses, and swimming and bathing places. Senate bill 219 amends the law defining the unprofessional and dishonorable conduct which justifies the revocation or suspension of a license by adding to the list of such causes (1) "attempting or agreeing or offering to procure an abortion unless such is done for the purpose of saving the life of a woman; provided that before procuring, aiding, abetting, attempting, agreeing or offering to procure an abortion under such circumstances the attending physician shall have used due diligence to obtain the advice and help of one or more consulting physicians"; (2) conviction of any offense involving moral turpitude or involving the violation of any statute regulating narcotics; (3) using liquors or drugs so as to render the physician unsafe or unreliable as a practitioner; (4) gross immorality tending to bring reproach on the medical profession; (5) advertising ability to treat by a secret treatment; (6) purchase, sale or barter of any medical degree, diploma or transcript, or fraudulent alteration of a diploma, certificate or transcript, or use of any diploma, certificate or transcript that has been purchased, fraudulently issued or materially altered; (7) impersonating or acting as a proxy in any examination; (8) personation of another licensed practitioner or permitting another person to use a license; (9) employing directly or indirectly any unlicensed practitioner or aiding any unlicensed person to practice; (10) the use by the holder of any certificate of any fictitious name, or name other than his own; (11) adjudication of insanity; (12) gross malpractice resulting in permanent injury or death of patient; (13) wrongfully encouraging any person to bring any action against any licensed practitioner for alleged malpractice; (14) unprofessional conduct likely to deceive, defraud or injure the public in matters pertaining to health. Senate bill 187 amends the law relating to the practice of optometry by increasing the annual registration fee to $5. Senate bill 217 provides that if any practitioner of the healing art, regardless of whether or not he is licensed to practice, shall wilfully and knowingly with intent to defraud make any statement regarding the physical condition of any person and with similar intent prescribe any medicine, operation or course of treatment for any ailment when, as a matter of fact, such person is not afflicted with such ailment, such practitioner shall be punished by imprisonment for one year or a fine of $1,000, or both. Senate bill 218 modifies the exempting section of the medical practice act by eliminating that portion which provides that "nothing in the act shall be construed so as to interfere in any manner with the individual's right to select or employ the practitioner or mode of treatment of his choice, or to interfere with the right of the person so employed to give the treatment so chosen."

PENNSYLVANIA

Society News.—Dr. Joseph C. Doane, Philadelphia, addressed the Lackawanna County Medical Society at Scranton, February 19, on diseases of the right upper quadrant of the abdomen.

Bills Passed.—The senate has passed the following bills: Senate bill 61, authorizing cities of the third class to appoint boards of health, and senate bill 417, requiring midwives to be licensed and registered by the state board of medical examination and licensure. The house has passed the following bills: House bill 786, providing that any board of school directors may employ one or more school nurses and any two or more school districts may jointly employ school nurses; house bill 565, providing that in school districts of the first, second and third classes the physical examination of a minor provided for by law shall be made by a physician employed by the board of school directors, and house bill 781, amending the medical practice act by providing for the reinstatement of licenses to practice of persons whose names have been removed from the records.

Philadelphia

Personal.—Dr. John O. Bower is to be appointed to a new chair of surgical research at Temple University School of Medicine which will be housed in a building to be erected at Broad and Ontario streets opposite the Samaritan Hospital. Mr. Cyrus H. K. Curtis, publisher, recently gave Temple University $500,000 toward the erection of the "skyscraper unit" in Temple University's building project.

Society News.—Dr. John R. Oliver, Baltimore, spoke on "Greek Medicine and Its Development in the Roman Empire" before the section of medical history of the College of Physicians of Philadelphia, January 19.——The tuberculosis death rate in Philadelphia (73 per hundred thousand persons), the lowest recorded by the city, is about half what it was fifteen years ago.——The Philadelphia County Medical Society was addressed, February 20, by the dean of the Philadelphia College of Pharmacy and Science, Charles H. LaWall, on "What Modern Professional Pharmacy Can Do for Medicine and What It May Expect in Return"; the medical side of this question was presented by Dr. Edward J. G. Beardsley. The society was addressed, February 27, by Dr. Charles H. Frazier on "Clinical Results in Surgical Treatment of Brain Tumors"; Dr. William J. Gardner, "Interpretation of the Encephalogram in the Diagnosis of Cerebral Lesions," and Drs. Francis C. Grant and Bernard J. Alpers on "Clinicopathologic Study of Brain Tumors." ——The city health department reports that 2,584 persons died of cancer in the city last year and that these comprised nearly 10 per cent of all deaths.——Dr. Thomas C. Stellwagen, Jr., addressed the Philadelphia Urological Society, February 25, on "A New Method for Lower Removal of the Ureter with Presentation of Instruments," and Dr. Elmer Hess, Erie, on urogenital anomalies.

SOUTH CAROLINA

Bills Introduced.—Senate bill 542 provides for a county board of health for York County. House bill 612 makes it unlawful for any institution caring for the sick or injured for pay to put an undergraduate nurse on special duty with a patient while that nurse is a student of a nurses' training school.

SOUTH DAKOTA

Bill Introduced.—Senate bill 203 appropriates $37,500 for improvements and equipment at the State Hospital for the Insane at Yankton. S. D.

Bill Passed.—Senate bill 77, amending the law relating to the state board of pharmacy by defining "pharmacopeia" to to mean the latest edition of the Pharmacopeia of the United States and "national formulary" to mean the latest edition of that work as published by the American Pharmaceutical Association, has been passed by the senate.

TEXAS

Bill Introduced.—House bill 604 would create a state board of chiropractic examiners and regulate the practice of chiropractic.

Bill Enacted.—Senate bill 204, amending section 49c of the county law so as to permit contracts for maintaining in a county hospital tuberculous patients from another county, has become a law.

Bills Passed.—The following bills have been passed by the house and the senate: Senate bill 49, creating a state board of pharmacy; senate bill 75, creating a board of nurse examiners,

and senate bill 285, providing that unclaimed dead bodies from eleemosynary institutions may be given to state anatomic boards. Senate bill 314, creating a state hospital for cancer and pellagra, has been passed by the senate.

UTAH

Bills Introduced.—House bill 135 creates a state board of institutions, provides for the appointment of a director and delegates to said board "all liabilities and powers heretofore exercised by the state board of health in regard to maternity hospitals and infant homes." House bill 146 amends the law that a physician or surgeon cannot without the consent of his patient be examined in a civil action as to any information acquired in attending the patient by providing that when any person brings an action to recover damages on any policy of accident insurance, or brings an action for the death of a patient either because of an alleged wrongful act or under a policy of life insurance, the bringing of the action shall operate as a waiver of the privilege that the attending physician be not compelled to testify in court.

VERMONT

Bill Passed.—House bill 48, providing for the licensing of chiropodists and the membership of one chiropodist on the state board of medical examiners, has been passed by the house and the senate. The chiropodist is to have voice in the deliberation of the board in matters pertaining to chiropody only.

WASHINGTON

Bill Introduced.—Senate Joint Memorial 7 memorializes Congress to amend the Harrison Narcotic Law by eliminating the right to compromise by accepting money in all criminal narcotic drug prosecutions.

Bills Passed.—The senate has passed the following bills: Senate bill 220, providing for sexual sterilization of socially inadequate persons at large or confined in state institutions, and senate bill 237, authorizing counties to build tuberculosis sanatoriums.

WEST VIRGINIA

Bill Introduced.—House bill 252 creates a state board of hairdressers and cosmetologists and regulates the business of hairdressing and cosmetology.

Bills Passed.—Senate bill 31, providing for sexual sterilization of certain inmates of state institutions, has been passed by the senate. House bill 18, providing for the education of persons to be designated at the expense of certain rural districts and allowing such students to enter the West Virginia University School of Medicine as special students possessing only a high school education, has been passed by the house.

WISCONSIN

Personal.—Dr. Gustave Windesheim, Kenosha, was reelected president of the Wisconsin State Board of Health at the annual meeting, January 31, and Dr. Cornelius A. Harper was held over as state health officer, beginning his twenty-sixth year in that position.

License Revoked.—The secretary of the Wisconsin State Board of Medical Examiners reports that the license of Dr. Robert D. Moray, Milwaukee, was revoked by the board, January 10. The court revoked his license, Dec. 27, 1928, following conviction on a charge of second degree manslaughter.

Bills Introduced.—House bill 291 provides for the establishment at the University of Wisconsin of the Wisconsin Orthopedic Hospital for Children. House bill 279 provides that the state board of health shall examine and license plumbers and their apprentices. House bill 300 provides that the state board of health shall appoint a committee of three licensed embalmers to examine and license embalmers. Senate bill 226 amends the law providing that a physician shall not be permitted to disclose any information in court that he has acquired in attending any patient in a professional character by excepting all inquiries respecting mental competence.

WYOMING

Bills Passed.—The following bills have been passed by the house and the senate: Senate bill 39, providing for the organization of a state board of nurse examiners; house bill 131, creating a state board of barber examiners and regulating the practice of barbering; house bill 218, providing that all licenses to practice medicine, surgery or osteopathy issued by the state board of medical examiners be renewed annually on the payment of a fee of $1.

GENERAL

Committee on Occupational Diseases.—The Permanent International Committee on Occupational Diseases will hold its fourth annual meeting at Lyons, France, April 3, at the Faculty of Medicine. The subjects to be taken up at this meeting include silicosis; cataract of occupational origin; the endocrine system, and poisonings. The French group of the committee is organizing a session to be devoted also to the discussion of the question, "What Is to Be Understood by Occupational Disease from the Point of View of Legislation?" Visits will be made to factories in the neighborhood. The chairman of the organizing committee is Professor Etienne-Martin and the secretary, Dr. Mazel, 54, avenue de Noailles, Lyons, France. Participants in the meeting must be members of the committee or have been introduced by a member or by the executive or by the organizing committee. The subscription is 50 French francs, and for members of the family of those taking part, 25 French francs, or 10 gold francs. The discussions will be held in French, English, German and Italian, and an official banquet will be given at the close of the meeting, April 6, which will cost 60 French francs a person; those desiring to take part should notify the committee promptly.

Medical Bills in Congress.—S. 2901, increasing the penalties for violations of the National Prohibition Act, has been signed by the President. S. 2366, regulating the conferring of degrees in the District of Columbia, has been reported out of conference and the conference report has been agreed to by the Senate and House. S. 3936, regulating the practice of the healing arts in the District of Columbia, has been signed by the President. S. 4518, creating a national institute of health, has been passed by the Senate. S. 5202, providing for a Florida branch of the National Home for Disabled Volunteer Soldiers, has passed the Senate. H. R. 13060, providing recognition for Dr. Walter Reed and those associated with him in the yellow fever investigations, has been signed by the President. H. R. 13752, providing for the construction of a children's tuberculosis sanatorium for the District of Columbia, has been signed by the President. H. R. 15387, regulating the practice of nursing in the District of Columbia, has passed the Senate with amendments and the House has agreed to those amendments. H. R. 16874, authorizing the commissioner of prohibition to pay informers for information concerning violations of narcotic laws, has passed the House. H. R. 16878, the omnibus pension bill, carrying a pension of $125 a month for the widow of Dr. Joseph Goldberger, has passed the Senate. H. R. 17297, introduced by Representative Merritt, Connecticut, amends section 2(a)6 of the Federal Caustic Poison Act by excluding cerium oxalate from the provisions of the act. H. R. 17314 and H. R. 17323, introduced by Representative Crail, California, amends section 202, paragraph 6, World War Veterans' Act, so as to authorize the director of the bureau to furnish every honorably discharged veteran of the Spanish-American War, the Philippine insurrection, and the Boxer rebellion such reasonable governmental medical, surgical and hospital services and such medicines and supplies, including wheel chairs, artificial limbs, trusses, and similar appliances, as the director may determine to be useful and reasonably necessary. H. R. 17325, introduced by Representative Wurzbach, Texas, provides for the establishment of a National Home for Disabled Volunteer Soldiers in the vicinity of San Antonio, Texas. H. J. Res. 430, providing for the appointment of a joint committee of the Senate and House to investigate the rank, promotion, pay and allowances of the commissioned and enlisted personnel of the army, navy, marine corps, coast guard, coast and geodetic survey, and public health service, has passed the House.

FOREIGN

Death of Professor Pirquet.—Cable dispatches, March 1, told of the tragic death of Prof. Clemens Pirquet and his wife in their home in Vienna, and of evidence which indicated that they had agreed to die together. Professor Pirquet was known throughout the world for developing the cutaneous tuberculin test which bears his name, and as director of the pediatric clinic at Vienna. He formerly was professor of pediatrics at Johns Hopkins University School of Medicine, Baltimore, and was head of the department of pediatrics at the University of Minnesota in 1923 for a brief period, resigning to return at once to Vienna (THE JOURNAL, Oct. 27, 1923, p. 1448). Pirquet, according to Abt's Pediatrics, developed the doctrine of allergy, 1907-1911 and "serum disease," 1905-1907, and the doctrine of feeding by nems, estimated by a height-weight ratio in place of calories. The nem is the amount of energy in 1 cc. of milk.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 9, 1929.

Fifth International Congress of Military Medicine and Pharmacy

To Great Britain falls the honor of organizing the Fifth International Congress of Military Medicine and Pharmacy, which will be held in the Great Hall of the British Medical Association. The first meeting of the congress, which is held biennially, took place in Brussels in 1921, with delegates from twenty nations; in 1923 at Rome, with delegates from thirty-five nations; in 1925 at Paris, with delegates from forty nations and in 1927 at Warsaw, with delegates from thirty-two nations. London is the largest city in the world, and is full of historical interest. Communications by underground railways, motor busses and tramways are excellent. Taxi fares are low. There are numerous parks, museums and theaters of every description. The Zoological Gardens form a special feature. There are twelve schools of medicine and many large hospitals. The London congress gives a special opportunity to British medical officers to welcome their foreign colleagues and to demonstrate the activities of the medical services of the navy, army and air force.

The following is a list of the subjects to be discussed: 1. Evacuation of sick and wounded by air and water: rôle of the medical services in combined operations; reporting countries, Great Britain and France. 2. Tropical fevers of short duration; reporting countries, Great Britain and the Netherlands. 3. Injuries to blood vessels and their sequelae; reporting countries, Great Britain and Belgium. 4. Physical and chemical analysis of the glass and rubber articles employed by the medical services; reporting countries, Great Britain and Spain. 5. The standard of dental and physical fitness in the various military services; reporting countries, Great Britain and Cuba. Only one paper on each subject will be submitted by each country. The preparation of the paper, however, may be undertaken by several collaborators. Papers must not in any circumstance exceed fifty pages of fifty lines each, no matter how many collaborators there may be. Papers may be submitted in English, French, Italian or Spanish, and they should finish with a series of conclusions not exceeding two pages. The conclusions should be translated into four languages by the country submitting the paper. The time allotted for the reading of the papers at the congress will in no case exceed twenty minutes for each country. Communications on the subjects under discussion, which alone are allowed to be submitted, must not exceed six pages of text, and only ten minutes will be allowed for reading the communication. The titles and summaries of the communications must be submitted to the secretary by March 1, 1929, so that they may be included in the official program. The discussion following is free, but not more than five minutes is allowed to each speaker. Lantern demonstrations may be given. At the conclusion of the discussion, all those who have submitted papers or communications, or who have taken part in the discussion, will meet in a separate room, so as to formulate general resolutions. These resolutions will be submitted to the vote of the congress at the final meeting.

An exhibition of the medical equipment of the services, and of drugs, dressings, surgical instruments and appliances will be held in connection with the congress. Visits will be made to naval, military and royal air force stations, where demonstrations of the various activities will be given. Receptions will be given at the Royal College of Physicians, the Royal Army Medical College, and at the Guildhall, in addition to others which are not yet definitely arranged. After the congress it will be possible to arrange day tours to places of interest in and around London, or longer tours to the Shakespeare country, Oxford and the west country, or to the English lakes and Scotland. All medical officers, dental surgeons and pharmacists belonging to, or having belonged to, the forces of any nation admitted to membership of the League of Nations, and officers belonging to organizations in association with the medical services are invited to the congress. The subscription is $2.50 for men, and $2 for women. This entitles the subscriber to copies of the official reports and to participation in the official excursions and receptions organized for the congress. Uniforms are optional. The wearing of uniforms is authorized for all foreign officers and for all officers of auxiliary services during the period of the congress. Uniforms should be worn for the inaugural meeting and for all official receptions.

The Value of the Visible and the Infra-Red Rays

In a paper read before the Zoological Society in 1924, Mr. Leonard Hill, F.R.S., urged the use of arc lamps and other sources of visible light, as well as access to the open air, as a means of keeping animals in captivity healthy and happy. Much good has come of the adoption of this suggestion. In a letter to the *Times* Mr. Hill points out that it is not so much the ultraviolet rays as the visible and the infra-red rays which have a good effect. The iguana lizards in the tropics are warmed by absorption of the sun's rays well above 100 F., and become excedingly active hot-blooded animals by day, catching and eating their food, and by night sinking back into inert cold-blooded creatures. The hot-water pipes which of old warmed up their house at the Zoo to 80 F. did not suffice to make them active and willing to eat; so they languished, lost weight, and died in winter. Given "close-up" incandescent lamps with wire screens to prevent burning, they basked in the rays, warmed up as by the sun, became active, and ate. So, too, with the tortoise.

In mammals and birds, the fur or feathers have great power of absorbing and holding the heat of a radiant source. It is easy to heat the fur of a rabbit, even up to 150 F., by putting it in the sun or near an arc lamp; hence its body warms up above the normal temperature, and if it could not seek the shade heat-stroke would result. By means of the radiant energy of lamps, the mammals and birds can then be warmed up. A bird's temperature is naturally about 104 F., and an effect is gained by lamps which cannot be got from hot-water pipes and a greenhouse temperature, and this apart from the cheerful visual effects of the light. Hence the small mammals and birds become happy in dull, dark winter days at the Zoo, given visible sources of radiant energy and the opportunity to warm themselves close up to these sources.

The antirachitic vitamin, naturally formed in the skin by shorter wavelengths of the ultraviolet rays of sunlight, can be supplied in the food, and it is not these short rays then which are so especially required in the Zoo. The visible and the shorter infra-red rays penetrate largely through the horny layer of the skin and, absorbed by the living tissue and blood of the skin, have their energy turned over therein. By concentration of these rays on the skin of the arm, it is possible to warm up the subcutaneous tissue to 117 F. before the limit of tolerance is reached. The longer infra-red rays have little power of penetration and so warm up chiefly the surface layers of the skin, and hence the warmth is conducted in. With such rays the limit of tolerance is reached when the subcutaneous temperature has been raised to about 110 F., because the surface layers have become unbearably hot. The shorter infra-red and the visible rays by their penetration excite flushing and sweating, and these natural reactions prevent overheating and afford a much pleasanter sensation of heat than that afforded by the dark heat rays, which produce a dry, uncomfortable sensation of heat. Such uncomfortable heat is felt by some people when the face

is exposed to any source of dull red or dark heat, whether it is steam, stove, gas fire, or electric heater. The oppressive feeling so induced is often put down to supposed escape of fumes or to excessive dryness of the air. But a screen in front of the face at once relieves the feeling; moreover, no fumes are given off by modern gas fires or an electric heater and drying of the air has nothing to do with the sensation. This is due to the nature of the radiant energy and its depth of penetration.

Some observations have been made with a new "radiant" designed for gas fires to give more visible and short infra-red rays. The light of a fire fitted with these radiants is yellowish and the heat feels more pleasant. The maximum of the spectrum of the new fire is more toward the visible region than in the case of the old fire. If one comes indoors with cool, dry skin, and puts one's forearm in front of a fire fitted with the old red radiants, and the other forearm in front of the new fire and at a like distance, the heating energy of the two being the same, one feels the new fire to be pleasanter and the skin to be less dry and burning. The heat of the new fire can be endured longer than that of the old. Acting through a thin screen of ice, the new fire affected a thermopyle more than the old fire, because more of the new fire's rays penetrated the ice screen. It has been shown by means of a rock-salt spectroscope and thermopyle that a piece of pigmented, desquamated, horny layer of human skin transmits about 40 per cent of the radiations from the new fire, while depilated whole skin taken from the abdomen of a rabbit transmits about 6 per cent. Much of the good resulting from sun treatment of wounds and surgical tuberculosis Mr. Hill ascribes to short infra-red and visible rays. These as well as the ultraviolet rays have a curative effect. The exposure of the naked body to a source of visible rays, such as an incandescent lamp or lamps attached to a bed cradle, may be useful in cases of shock and exhaustive disease, warmth so derived being of greater advantage than dark heat afforded by a warm room and hot water bottles. With such warmth the window can be opened and the effects of open air and sunlight treatment obtained. Overheating can be prevented by the use of a fan.

Protection of Civilians Against Chemical Warfare

Dr. F. R. Humphris gave an address before the Royal Sanitary Institute on "The Civilian Population and Chemical Warfare." He said that the royal air force maneuvers in 1927 and 1928 showed that London and our great cities could not be defended from attack from the air, "poison gas" being the dangerous missile. Each city would have to undertake its own protection. Protection in the field was afforded by masks and dugouts, neither of which was available in huge crowded cities. Yet protection must be afforded if we were not to lose our place in Europe, endangering both our existence and our influence in its peace councils. The first attack at Ypres in 1915 on unprepared troops cost 5,000 lives and an enormous number of casualties in a few minutes, and was a clear indication as to what would happen to our undefended civilians. The gases which had to be dealt with were discharged in liquid form and were slow in evaporating from the streets. It was proposed that an organization should be formed divided into four sections. The first section would have the duty of getting gas-proof rooms—like those prepared for disinfection after an infectious disease—in each house for the incarceration of the inhabitants, while the second section was clearing the roads by flushing down and the use of appropriate chemicals. The third section would be necessary for decontaminating the clothing and persons of those who were endangering others and themselves by gas carried on their persons and clothing, a very dangerous matter. The fourth section, to consist of the voluntary aid societies under the local physicians, would give first aid and provide for removals to a hospital. Wholesale removals would be necessary in the more dangerous areas, with provision of billets and necessaries temporarily.

PARIS

(From Our Regular Correspondent)

Jan. 23, 1929.

Whipple's Method in Azotemia

M. C. Lian and Miss V. Heimann reported at the Société médicale des hôpitaux five observations on anemic and azotemic patients in whom the treatment with veal liver had brought about improvement in both conditions; i. e., an increase of erythrocytes and a decrease of urea. Azotemia varied from 0.52 to 1.1 Gm. and anemia from 600,000 to 3,500,000 erythrocytes per cubic millimeter of blood. The dose of veal liver was 126 Gm. either every day or every second day. The results were very good. Lian thinks that the method ought to be applied to patients with hypertension and slight azotemia who are on a low nitrogen diet. It would be particularly helpful to use it in cases in which the patient is on a meat diet: the return of azotemia could thus be avoided and also anemia caused by the low nitrogen diet.

International Congress of Sanitary Aviation

Preparations are being made now for the inauguration of the International Congress of Sanitary Aviation, the first of its kind, which will take place in Paris, May 15-20, 1929. Information may be obtained from the headquarters, 35, rue François Ier, Paris. Sanitary aviation was created in France, where it developed rapidly on account of its services in countries such as Morocco and Syria, which have no normal transportation. The following questions will be treated: sanitary aviation in the outlying districts; sanitary aviation in the colonies; sanitary aviation in the navy; sanitary aviation as a means of evacuation in war time; physiologic conditions for transportation by airplane; consideration of the treatment of sick and seriously injured people transported by airplane; sanitary aviation in peace; sanitary aviation bases. There will be two "sanitary days" with public demonstrations, May 19-20, on the Polygone of Vincennes, visiting of the aerodrome of Orly and an excursion to Reims. The working sessions and discussions will be held in the Institut océanographique, 195, rue St. Jacques.

Social Insurance

This new law, which is at present the main worry of the medical profession of France, is being pushed to execution by the department of hygiene and labor. The Conseil d'Etat is establishing a regulation to put it into practical form, and the minister has asked various competent persons to help him by presenting their observations to the Conseil within one month. The Fédération des syndicats médicaux, which has 17,000 members, has sent a circular letter to all members of parliament, in which the question was clearly presented. It says that the physicians would have been ready to support the law if it had taken into consideration the corrections which they suggested in order to avoid material as well as moral damage to the profession. The corrections which they suggested, and which equally concern the interests of patients and the state, applied to the budget. Senator Gaduad, M.D., suggested legitimate amendments which would have satisfied everybody. The letter clearly states that, in case the amendments are not adopted, the medical profession as a whole will refuse to participate in the application of the law. This means that it will not take care of patients sent by the social insurance companies. This is a well defined ultimatum resulting from decisions made by the Fédération des syndicats during the past two years.

Death of Fernand Widal

Prof. Fernand Widal died, January 14, at the age of 66, at the height of his scientific activity and fame. He was born in Algiers, the son of an army physician. In Paris, he was first in the competitive examinations for externs, for interns and for the professorship. At the age of 31 he became head physician

of the hôpital Cochin in Paris; at 33 he was made a professor of the faculty. In 1911 he became professor of medical pathology, succeeding his teacher Dieulafoy. He was a member of the Académie de médecine, a member of the Académie des sciences (Institut), and a short time ago had been promoted to the highest degree of the Légion d'honneur, the grand croix. He was a bearer of the Osiris prize and was to be suggested for the Nobel prize.

Widal was at the same time a medical practitioner and a laboratory man of note whose activities covered many phases of pathology. His first investigations were made in the field of bacteriology. He first studied the streptococcus; then, together with Chantemesse, he discovered the bacillus of dysentery (now called Shiga's bacillus). He demonstrated the transmission of typhoid by water and discovered the phenomenon of the agglutination of the typhoid bacillus by the serum of the patient, thus introducing a very valuable aid to clinical diagnosis. In collaboration with Chantemesse he was an early investigator of serotherapy and antityphoid vaccination, although he did not push the work to practical conclusion. Recently he had been investigating renal pathology in edema, azotemia, and the modifications of the blood serum and other body fluids by the introduction of foreign substances, especially microbial preparations. He introduced clinical seroreactions and cytodiagnosis. The theory of colloidoclasis, to which he contributed the phenomenon of shock, and which was later developed by his pupils, remains an interesting attempt to explain complicated facts of great importance in pathologic biology. Professor Widal was a great leader whose pupils became leaders in their turn. He was a member of the Conseil supérieur d'Hygiène and of the Conseil supérieur de l'Instruction publique.

Deaths

The Faculté de médecine de Paris, shocked only a few days ago by the death of Professor Widal, has suffered now another loss in the death of a man almost equally prominent—Professor Sicard, professor of internal pathology. He succumbed suddenly to an attack of a chest disorder, at the age of 53. He had published a number of works, and he was thought to have a brilliant future before him. He possessed an inquiring and inventive spirit. We owe to him many important discoveries in therapeutics, in various fields, but principally in neurology. He introduced the treatment of neuralgia by injections of alcohol with stovaine, followed by iodized oil. He made popular the use of this substance, which is impermeable to roentgen rays, for radiologic diagnosis. Medicine owes likewise to him the method of treating varices with sclerosing injections. He had made special studies also in methods of desensitization in anaphylaxis, in the serotherapeutic treatment of poliomyelitis, and in malaria treatment for paresis. He was one of the favorite pupils of Widal, and only a few days before his death he had delivered the funeral address in honor of Widal, whom it was thought he would succeed. He was a man of high culture and had often represented the Faculté de médecine de Paris in foreign countries. When he died, he was returning from a visit to Cairo, where he had attended an official ceremony. He was one of the most popular consulting practitioners among not only the French but also the foreign clientele.

Inspecteur général Delorme, of the army medical corps, has died at the age of 80. He had been one of the most brilliant surgeons of the army, and had been for many years professor of operative medicine at the Ecole supérieure du Val-de-Grâce. He had published a number of didactic treatises and, more particularly, a work on the "Surgery of the Hand," which has remained a classic in this field. At the beginning of the war, he had resumed his post on the Comité supérieur du Service de santé, and had, among others, advocated the immediate treatment of all wounds with tincture of iodine. He had been for thirty years a member of the Academy of Medicine.

BELGIUM

(From Our Regular Correspondent)

Dec. 22, 1928.

The Belgian Hospital Association

For a long time, those who collaborate in Belgium, in various ways, in the organization, creation and management of hospital establishments have regretted the lack of contact between them and have suggested the organization of an information and documentation service, the holding of meetings for the discussion of common problems, the publication of a periodical bulletin, and the like. The need appears now to have been met by the Association belge des hôpitaux, the constitution of which has just been elaborated after several sessions of a committee composed of members of the medical profession, chairmen and members of committees on public assistance, higher officials of the public health service and of the board of public assistance, directors of hospitals and clinics, delegates of the Red Cross Society, and others.

The association has divided its work into four sections: legislation, administration and organization of hospitals, hospital hygiene, and the construction and hygienic aspects of hospital buildings. It will begin its activities in October, and will consist of corporation members (institutions, centers engaged in the treatment and care of patients) and other voting members (presidents, directors and administrators of hospital establishments). The committees on studies, which will assure veritable mutual instruction on hospital questions, will meet soon, and the first number of the regular bulletin will appear during November. The president of the association is M. Dom, honorary director general of public charities.

Yellow Fever on the Congo

Much has been said and written, during the past year, on the appearance of yellow fever in the Belgian Congo. Dr. Van Campenhout has just published, through the international bureau of health, a bulletin giving an accurate account of the situation in that region. The first appearance of cases of yellow fever on the Belgian Congo dates from 1912. Two passengers on a steamer developed the disease and died in the port of Matadi. In 1917, from June 16 to October 30, a period of more than four months during the dry season, six cases of yellow fever occurred among the residents of Matadi. No natives were attacked, and the cases may be regarded as sporadic. The epidemic of 1927-1928 broke out in the middle of the rainy season. Up to Feb. 15, 1928, there were, in all, forty-five cases; namely, twenty-five cases in white persons, with eleven deaths, and twenty cases in colored persons, with fifteen deaths. According to official reports, the origin of the epidemic must be ascribed to a steamer that arrived after touching at contaminated ports of Senegal and Guinea.

As to prophylactic measures adopted in connection with the campaign against the epidemic: the governor of the Belgian Congo informed by telegraph the governments and the consuls of the west African colonies, under date of Dec. 26, 1927, of the existence of yellow fever at Boma and at Matadi. At Boma, beginning Dec. 25, 1927, a thorough clean-up campaign was inaugurated. Five hundred men and all the available motor trucks were put to work. The contents of numbers of manure piles were collected and buried. All sorts of refuges for mosquitoes were eliminated; eavestroughs and gutters were removed, and all boats and wharves were sprinkled regularly with petroleum. Ships were required to anchor out in the open river, and loading had to be done in the daytime. When the clean-up campaign was completed, the care of the city was entrusted to a definite crew of 100 men. The campaign was also extended to the surrounding native villages, some of them being removed to different sites. The cars of the Mayumbe Railway were treated with sulphur. Trains were allowed to depart only in the daytime. The transportation of natives, by railway, by boat

or by overland routes, was prohibited, and, while not strictly enforced, extensive traffic was suppressed. After sunset, the opening of cafés, motion picture houses and other gathering places was regulated by the authorities. Every person coming down with the fever, irrespective of race, was immediately isolated where no mosquitoes could reach him, and his home was fumigated by the authorities.

At Matadi, the cleaning-up campaign was much more laborious. The town covers a large area, and the native population is very numerous. The campaign was divided into two periods. The first consisted in destroying the larvae, and the second in killing the adult stegomyias. At the present time, energetic antilarval measures are still being applied at Matadi. Furthermore, the results secured in America through the praiseworthy and persevering efforts of the Rockefeller Foundation, and the absolute success of the campaign in Rio de Janeiro under the impulse of Dr. Oswaldo Cruz and his followers, awaken the firm hope that, in Africa as well, the eradication of this calamitous scourge may be regarded as possible. Since 1920, the Rockefeller Foundation has decided to take part in the campaign against yellow fever in Africa.

ITALY

(From Our Regular Correspondent)

Dec. 31, 1928.

The Crusade Against Urbanism

The council of ministers, acting on the suggestion of the premier, has approved the draft of a law that would give to the prefects the power to establish ordinances directed toward the limitation of the excessive increase of population in the cities.

At present there are ten million inhabitants living in the principal cities of the provinces, or almost a quarter of the entire population of the realm, and such crowding together is pregnant with dangers from the point of view of the physical and the moral health of the family, in that it aggravates the problems of housing, the procuring of drinking water, and all the hygienicoprophylactic services.

Award of Medals to Hospital Nurses

At the Ospedale britannico in Roma, the head nurse and ten nurses recently received a silver medal as a reward of merit from the public health service. The medals were bestowed by the king of Italy for the services performed by the nurses during the Calabro-Sicilian and the Marsian earthquakes and likewise during the World War.

The Italian Society for the Advancement of Science

The Società italiana per il progresso delle scienze recently held its seventeenth session in Turin, under the chairmanship of Prof. Filippo Bottazzi, physiologist of the University of Naples. There were section meetings and general sessions. One section comprised the biologic sciences.

In his opening address, Professor Bottazzi gave a brief account of the history of the society, which began its annual meetings in 1839 and has continued them up to the present, with the exception of twenty years from 1842 to 1862, the period of the wars for Italian independence. However, the society has lacked the necessary means to perform its two fundamental tasks: the advancement of science and the spread of scientific culture throughout the country. Furthermore, in the little that has been done some errors have crept in, among which may be mentioned that of having held that there are two distinct forms of science, which exist independently of each other, a pure science and a practical science, and that of having preferred the so-called practical science. In the few gifts that have been made, preference has been given to physics and chemistry, to the neglect of biology. The speaker requested of the minister of public instruction the creation of a biologic laboratory of research on aeronautics, asphyxiating gases and alimentation.

Professor Morpurgo of Turin spoke of the contributions that laboratory experiments have made to the knowledge of the nature and the origin of malignant tumors.

Prof. M. Donati, clinical surgeon of the University of Turin, discussed the treatment of malignant tumors, on the basis of the statistics of Professors Niceforo and Pescarolo. He stated that the final results depended not only on the species, the localization and the stage of the tumor but also on the technical skill of the operator. During the past twenty years, there has been a marked improvement in the operative prognosis.

There were numerous papers on the physiology, pathology and hygiene of work. Professor Foà spoke on the psychophysiology of work, Professor Herlitzka on the energy of work, and Professor Gemelli on vocational guidance. Professor Castellino referred to the instructional aspects of work, emphasizing also the need of factory, or industrial, physicians, and of establishing closer relations between scientists and industrialists, in the interest of the workers and of production in general.

Professor Simonelli of Florence reported the results of a first series of experiments, performed by him in collaboration with Dr. Ferri, on the physiology of respiration through resistance.

Professor Blanc was chosen president of the society, and Florence was selected as the place of the next meeting.

Simultaneously with the meeting of the Italian Society for the Advancement of Science, was held the annual assembly of the Società italiana di biologia sperimentale, of which Professor Fano, senator, is president and Professor Bottazzi is the general secretary.

Meeting of the Accademia Lancisiana

The Accademia Lancisiana of Rome recently inaugurated its second academic year in a fitting manner. Professor Fioretti, who presided, surveyed the work accomplished by the society during the past year, announced the names of new members of the society, and informed the assembly that the governor of Rome had established an annual prize of 3,000 lire ($160) for the best scientific studies presented to the academy.

Dr. Chiucini presented a case of sacrolumbar peripachymeningitis and purulent meningitis resulting from osteomyelitis of the sacrum.

Professor Genovese and Dr. Zallocco reported the results they had secured from the use of irradiated ergosterol in the treatment of rickets.

Professor Egidi spoke on the surgical treatment of peptic duodenal ulcer.

Dr. Marino illustrated with slides the results obtained, in the Clinica ortopedica of Rome, by means of tendon transplants applied to the quadriceps femoris muscle.

Professor Muzzi spoke on mechanotherapy and presented a device of his own invention that enables several patients to make simultaneous use of mechanotherapeutic treatment.

Private Professional Work of University Professors

In a recent circular letter, the minister of public instruction expressed the view that private professional work on the part of university professors is not incompatible with their regular duties, in that it constitutes a useful field of experience for the study of scientific problems. However, the authorities should see to it that the demands of instruction are completely satisfied, and also that the private work is not done in the university buildings, except on payment of such sums as will compensate the university for the privilege.

Prizes Awarded at the Exhibit on Tuberculosis

The prizes won at the International Exhibit on Tuberculosis, held in Rome on the occasion of the recent International Conference, have been awarded as follows: the gold medal of the

king, to Poland; the gold medal of the premier, to Dr. Bocchetti, director of the Sanatorio militare in Anzio; the gold medal presented by the public health service, to the administration of the city of Rome.

TURKEY

(From Our Regular Correspondent)

Jan. 22, 1929.

Construction of New Water Plants

Though the water plants of Constantinople, Smyrna and Adana were established some decades ago, almost all other large and small cities in Turkey lack this necessary convenience. To a number of cities, spring water from the environment is brought by pipes; but, as a modern plumbing system is lacking, the water has to be carried in vessels from the fountains into the homes. Those fountains vary in number according to the size of the city. It is not rare to find several hundred fountains in one city. Rural communities and villages have mostly been established where there was a natural supply of pure spring water. For drinking purposes the spring water from certain fountains in the environment of the large cities is used. Often this drinking water is carried twenty miles in large bottles and barrels before it reaches the consumer. As a result of typhoid and intestinal parasites in most instances being traced to contaminated water supplies, the ministry of hygiene sponsored the introduction of a bill for the regulation of all water supplies in the country. The water supply law was drafted in April, 1926. In townships the municipalities are responsible for the construction of new water supplies; in the villages and rural communities the aldermen will have this responsibility. All water supplies functioning through private charitable institutions or other public administrations shall be turned over with sources, supply and income to the respective municipalities or aldermen. Excepted from this regulation are private companies having special contracts with governmental or municipal departments. Privately owned springs shall be expropriated for the benefit of the municipality, but their owners shall be adequately compensated. The construction, sanitation and administration of new water plants shall be the responsibility of the municipalities and aldermen. Within five years from the date of the promulgation of the water supply law, all municipalities are under obligation to make provision for an adequate and clean water supply in accordance with local conditions and according to public health standards. At the end of five years the ministry is to have received the plans of all municipal water supply plants. The plans are to give detailed information as to the construction of the plant and of the quantity, quality and other properties of the water. Within two months the ministry of hygiene shall have decided on all projects submitted and within two months from the date of approval of the plans of water supply plants all municipalities shall commence construction. The construction of these plants in the villages shall be made according to directions from the local health department. If a village is in need of a spring situated in adjacent territory, this spring shall be bought from the county owning it in the name of the village and with the approval of the ministry of hygiene. The prime minister, the minister of the interior and the minister of hygiene shall be charged with the execution of the law.

Scarlet Fever Epidemic

With the beginning of August, several cities in Asia Minor reported serious outbreaks of scarlet fever. Because of lack of education of the public in health matters and the ineffectiveness of placarding the homes (the placards being ignored by women visiting with their children among the sick), the disease soon spread from the cities to the rural communities. In Konia, where for three months all schools were closed on account of the epidemic, the outbreak was especially serious, the disease appearing in a very virulent form. Several children of physicians were among the victims. The morbidity was higher among school children, the fatality higher among children of preschool age. The concealment of new cases by parents, especially in rural communities, was responsible for the spread and long duration of the epidemic.

The ministry of hygiene sent a specialist from the Constantinople institute of hygiene, Dick tests were made, and several vaccination centers were organized. Newspapers carried on a publicity campaign and the public availed itself freely of the opportunity of vaccination.

Scarlet Fever in the Province of Konia

	Cases	Deaths
July	132	21
August	214	46
September	203	58
October	325	43
November	245	43
December	297	56

Another serious outbreak was in Kastamoni, where also the schools were closed for several months. Here the same preventive measures were put in force.

Cases Reported in Kastamoni

	Cases	Deaths
July	8	2
August	13	2
September	179	20
October	28	5
November	83	12
December	70	11

Though scarlet fever has been a notifiable disease in Turkey for almost twenty years, serious outbreaks have not been reported till recent years when the disease has appeared in virulent form. In the Mediterranean provinces, scarlet fever does not appear in epidemic form.

Cases of Scarlet Fever in Turkey Reported Since Beginning of 1923

Year	Cases	Deaths
1923	161	24
1924	2,219	326
1925	1,062	274
1926	1,152	235
1927	1,456	266
1928	4,477	863

Because of the high fatality and bad after-effects of scarlet fever, the disease is much dreaded by all classes of people. In the vernacular the disease is called "scarlet shirt," and a popular saying is, "With measles there is cause for anxiety in the beginning, with scarlet fever in the end."

AUSTRALIA

(From Our Regular Correspondent)

Jan. 7, 1929.

Hydatid Disease in Australia

There is a serious incidence of infestation with *Echinococcus granulosus* (Batsch) in the herbivora of Southern Australia. As this disease is common to both man and food animals, the subject warrants close study and the institution of preventive measures. A small series was thoroughly investigated in New South Wales by Ross in 1926, and 35.7 per cent of sheep and 37.1 per cent of cattle were found to be infested. In Western Australia in 1908, the incidence was found to be 20.1 per cent for sheep and 19.7 for cattle. In Queensland, hydatid disease is a rarity. More recently (April and May, 1928), Fairley and Penrose have surveyed the incidence of hydatid and other diseases in the herbivora and porcines of Victoria. These were macroscopically examined at the abbatoirs, and of 60,000 sheep 16.5 per cent showed evidence of infestation. As acquired

immunity in metazoal disease is a rare phenomenon, it is to be expected that the incidence would increase with age, and it was found that, whereas 6.6 per cent of the lambs were infested, the incidence had increased to 26 per cent in the three-year-olds. Cattle were infested to the extent of 23.9 per cent, 4,922 having been examined. Here, again, the incidence increased from 3.5 per cent in the milk teeth group to 36.2 per cent in the 3¼ year upward group. The hydatid incidence in procines was low, being 0.5 per cent of a series of 2,497. Under the age of 3 years the disease is low, but over that age the incidence jumps to 5.2 per cent.

A survey of the canines by Ross in 1926 throws a valuable guiding light on the preventive *point d'appui* of hydatid infestations of human beings. It was found that 40 per cent of station dogs ("station" in Australian parlance would be analogous to "ranch" in America), 25 per cent of slaughter yard dogs, 7.1 per cent of drover's dogs and 0 per cent of city dogs harbored the small intestinal tapeworm *Echinococcus granulosus* (Batsch). These figures certainly indicate that in city abbatoirs the system of meat inspection is sufficiently thorough to eliminate the great bulk of hydatid-infested viscera. The common practice that obtains in country abbatoirs and on farms and stations on throwing infested viscera to dogs represents the present weak link in the chain of prophylaxis. Boiling of such material for ten minutes would destroy the viable scolices, but it would be wiser to prohibit the feeding of raw offal to dogs.

The routine three monthly administration to dogs of a suitable vermifuge, such as arecalin hydrobromate, would have a prophylactic value. In the country districts of Australia, the dog is treated as an intimate friend of both adults and children. Australia's freedom from rabies is one of the reasons for this unwise familiarity. Health education in the dangers of such close association, and the possibility of the contamination of uncooked foods and water supply by dogs, is a much needed step toward the reduction of the incidence of human infestation. The complete and exhaustive treaties on hydatid disease by Harold R. Dew can be confidently recommended to students of the subject.

Queensland Cancer Campaign

The sum raised in response to the public appeal for funds to provide special facilities for the relief and cure of cancer in Queensland now exceeds £50,000 (THE JOURNAL, July 14, 1928, p. 109). The campaign committee is now proposing to wind up its affairs and hand the money over to an appointed "cancer trust." No time has been wasted in applying the money to the designed purpose. November 6, the first patient was treated at a high voltage roentgen therapy plant installed at the Mater Misericordiae Public Hospital, Brisbane. The total cost of the plant, including installation, has been £3,500. This plant is the most modern type available. It is capable of generating 300,000 volts. The official opening was conducted, December 20, by the governor of Queensland, Sir John Goodwin, himself a medical man. The motif of the opening ceremony was that the present installation was merely the beginning of a widespread movement to do all that was humanly possible to combat the cancer scourge. The economic as well as the humanitarian importance of such a movement was fully recognized. The original intention to construct and equip a special cancer center has been modified in favor of roentgen-ray and radium therapeutic departments at existing hospitals. It was feared that patients with cancer would object to being labeled by their attendance at a special institution, and there is more likelihood of the detection of early cases at a general surgical clinic. Every known method of cancer treatment is being investigated by the committee. The lead treatment of Blair Bell was studied by two members of the committee, Dr. Graham Brown and D. L. M. McKillop, who were visiting England. The latter also attended the cancer conference held in July. A supply of lead colloid prepared by Crookes was forwarded to the committee, but the necessity of employing a fresh product made it advisable to have an Australian preparation. Accordingly, Dr. W. J. Penfold, director of the Alice Baker, Thomas Baker and Eleanor Shaw Institute for medical research at the Alfred Hospital, Melbourne, has been engaged in the preparation of a therapeutic compound of lead. In addition, the committee has communicated with Dr. Ullmann of Santa Barbara and has now arranged for the preparation of lead orthophosphate at the University of Queensland. A number of patients are receiving lead treatment under the control of the clinical and pathologic subcommittee under the chairmanship of Dr. J. Lockhart Gibson.

Munificent Donation to Sydney University

Chairs of medicine, surgery and bacteriology at the University of Sydney have been established by Mr. George H. Bosch, a wealthy citizen of Sydney. Property valued at £220,000 has been given to the university for this purpose, the income from which will also equip the necessary laboratories. Mr. Bosch has demonstrated an intelligent and practical interest in medical research in Sydney for some time. He has followed the neurologic investigations of Dr. N. D. Royle with attention and has manifested more understanding of physiologic and pathologic problems than is usually evinced by persons who have not studied medicine. Last year he gave £27,000 to the university for the purpose of founding a chair of embryology and histology and for the promotion of medical research. This encouraging donation will enable Sydney University to advance toward the ideal of a professor who is freed from all routine work and thus enabled to devote his undivided attention to the supervision, inspiration and direction of a research and instructional team of highly qualified workers.

Medical Survey of the Australian Wood-Working Industry

At the request of the federal council of the Australian timber working union, the division of industrial hygiene of the commonwealth department of health conducted an inquiry into the effect of dusts from Australian and imported timbers on those engaged in timber-working industries. The prevalence of nasal irritation, asthma and dermatitis was investigated in thirteen joinery and furniture factories. Clinical examinations of 208 workers were made in Melbourne, and a questionnaire was forwarded to rhinologists and dermatologists throughout Australia. It was found that 37 per cent of all factory examinees presented departures from normal with regard to their nasal condition. Slight mechanical irritation was found in 19 per cent, and 5 per cent were suffering from chronic sinusitis. Abnormalities of the nose and throat which were antecedant to occupation in the wood-working industry were found in 13 per cent. It is considered that the percentage of workers found affected is considerably above the number that would be discovered in the ordinary civilian population, and that the causative agent in these cases has undoubtedly been the fine wood dust and siliceous (from finishing machines) particles inhaled. Although not so apparent as would be expected, persons engaged on machines fitted with efficient exhausts showed less nasal trouble than others working in factories where no exhaust system was installed. Wood machinists were the occupational group most affected. Hardwood (*Eucalyptus regnans, E. obliqua* and *E. gigantea*) appeared to be the most irritating timber. Aural abnormalities were detected in 34 per cent of the examinees. Suggestive evidence of occupational asthma was found in two workers who had been specially examined on account of dermatitis. Dermatitis definitely due to wood-working was found in 0.5 per cent of the routine examinees, but the questionnaire to dermatologists revealed ten cases. In the majority

of these, blackwood (*Acacia melanoxylon*) was found to be the causative agent. There was no evidence that the incidence of pulmonary tuberculosis is any greater among workers in the wood-working industry than it is in industrial workers generally. The installation of efficient exhaust hoods is considered to be the most important preventive measure against the upper respiratory, aural and dermatologic hazards of wood-workers.

BERLIN

(From Our Regular Correspondent)

Jan. 26, 1929.

The Roentgenogram with Body Outlines

Before the Berliner Medizinische Gesellschaft, M. Cohn, director of the roentgen department of the municipal hospital in Friedrichshain, described and demonstrated methods of taking roentgenograms showing the body outlines, especially in connection with moving organs (chest and abdomen). Stereoscopic pictures with the earlier types of apparatus required too long an exposure, so that moving organs, such as the heart and the gastro-intestinal tract, could not be taken. Dioclés in Paris was the first to construct an apparatus with which the picture could be taken in a second by pressing a button. In roentgen stereoscopy the body outlines are brought out more clearly if the number of contrast points is increased by bringing several organs into the picture. In many cases it is a question of determining the relative position not only to the bone but, above all, to the surface of the body. Since the skin cannot be recognized "corporeally," spiral chains of shot are wound about the body so as to produce the stereoscopic effect of the body surface. The method is well adapted to roentgenograms of the skull. When projected stereoroentgenograms were viewed through ordinary red-and-green spectacles, it was possible, as was demonstrated, to get a distinct impression of the outlines of the body.

During the discussion, J. Tugendreich expressed the view that an objection to the method was the fact that the roentgenogram can be made only of a patient in a standing position. Endeavors are being made to perfect a method for the stereoscopic transillumination of the gastro-intestinal tract. Professor Adam paints the overlying skin of the skull with a gray ointment, in order, in making stereoscopic pictures of the skull, especially in eye injuries, to establish the position of the surface.

Federal Accident Prevention Week

In February or March, the leagues of the industrial unions, with the collaboration of all the leagues and groups interested in accident prevention and the promotion of public health, will hold a federal accident prevention week. An exhibit, a series of addresses and other interesting features are being organized. In arranging the program for the accident prevention week, attention will be given to the part played by alcohol as a contributory factor in the causation of accidents, which is recognized as a very important question. Experience has shown that everywhere, with the decline in the use of alcoholic beverages, there has been a decrease in the frequency of accidents. According to official reports, in the large breweries of Frankfort-on-the-Main, from 1903 to 1904, following the doing away with the custom of the "Freitrunk" (free beverages), the number of accidents among the brewers dropped from 184 to the level of 117. At the Ilseder Works, where, in 1897, there were 15.1 accidents to 100 workmen, the number of accidents declined, with the introduction of alcohol-free beverages and the strict limitation of beer consumption, to 9.47 per hundred workmen in 1900 and to 2.3 per hundred in 1904. It is doubtless true that various improvements in the manufacturing processes have contributed to this result, but the influence of the reduced consumption of alcohol beverages is recognized in the official reports of industrial inspectors as plainly evident.

Marriages

MARY EUGENIA CLOUGH, Philadelphia, to Mr. Sidney E. Friedman of Harrisburg, Pa., Dec. 31, 1928, at New York.

WALTER VANALSTYNE EMERY, Chester, Pa., to Miss Gertrude May Bray of Philadelphia, Nov. 30, 1928.

ABRAHAM M. RAPOPORT to Miss Katherine Chatlin, both of Norristown, Pa., Dec. 20, 1928.

JULIUS H. GROWER to Miss Minne Shapiro, both of Middletown, Conn., February 3.

OSWALD ROBERTS JONES to Miss Elizabeth Mulvane, both of New York, February 12.

Deaths

Walter Barry Jennings ✠ Middletown, Conn.; Medical Department of the University of the City of New York, 1898; member of the American Psychiatric Association; on the staff of the Connecticut State Hospital; formerly on the staffs of the Trenton (N. J.) State Hospital and St. Mary's Free Hospital for Children, New York; served during the World War; author "Hygiene of Pregnancy"; aged 55; died, January 22, at the Norwalk (Conn.) Hospital.

John Webb MacQuillan ✠ Chattanooga, Tenn.; University of Dublin, Ireland, 1881; past president of the Hamilton County Medical Society; on the staff of the Erlanger Hospital; neuropsychiatrist to the U. S. Veterans' Bureau, 1920-1923; aged 71; died, January 23, of starvation due to stenosis of the duodenum following old healed ulcer.

Frederick Samuel Lovell ✠ New York; Medical Department of the University of the City of New York, 1886; formerly associate professor of diseases of the nose and throat, New York Post Graduate Medical School and Hospital; on the staff of the Bronx Eye and Ear Infirmary; aged 68; died, February 7, at Edwards, N. Y.

Richard Edwin Shaw, Brooklyn; Long Island College Hospital, Brooklyn, 1884; member of the Medical Society of the State of New York; aged 68; supervisor, maritime medical service, and formerly superintendent of the Long Island College Hospital, where he died, February 9, of pneumonia.

William Andrew Wallace ✠ Spartanburg, S. C.; University College of Medicine, Richmond, 1906; past president of the Spartanburg County Medical Society; formerly on the staff of the Spartanburg General Hospital; aged 46; died, January 31, following two operations for mastoiditis.

John Alphonso O'Donoghue ✠ Washington, D. C.; Georgetown University School of Medicine, Washington, 1900; associate professor of medicine and clinical professor at his alma mater; on the staff of the University Hospital; aged 54; died, February 13, of cerebral hemorrhage.

Ezekiel Bennett Andrews, Center Ossipee, N. H.; Harvard University Medical School, Boston, 1889; member of the New Hampshire Medical Society; formerly member of the school board of Ossipee; health officer of Freedom; aged 67; died, Dec. 4, 1928, of chronic nephritis.

Charles Henry Lester, Kansas City, Mo.; Kansas City Medical College, 1879; Bellevue Hospital Medical College, New York, 1880; member of the Kansas Medical Society; formerly county coroner; aged 71; died, February 3, at his home in Olathe, Kan., of heart disease.

Joseph Rankin Losee ✠ New York; Long Island College Hospital, Brooklyn, 1907; member of the American Society of Clinical Pathologists; aged 45; died, February 5, at St. Petersburg, Fla., of a self-inflicted wound which severed blood vessels in the neck.

Thomas Fitzgerald Elkin, Tupelo, Miss.; Medical Department of the Tulane University of Louisiana, New Orleans, 1891; member of the Mississippi State Medical Association; on the staff of the Tupelo Hospital; aged 59; died, January 30, of uremia.

Thomas Dyer Mudd, Washington, D. C.; College of Physicians and Surgeons, Baltimore, 1894; member of the Medical Society of the District of Columbia; aged 66; died, February 11, of arteriosclerosis, acute myocarditis and portal cirrhosis of the liver.

Ervin Wright, Rollo, Mo.; Medical College of Indiana, Indianapolis, 1880; member of the Missouri State Medical Association; formerly county coroner of Huntington, Ind.; aged 80; died, January 30, following an operation for gallstones.

Isaac E. Patterson, Benton, Pa.; Jefferson Medical College of Philadelphia, 1869; member of the Medical Society of the State of Pennsylvania; Civil War veteran; aged 85; died, January 17, of acute nephritis and heart disease.

Joseph Townsend Freeman ✠ Paris, Tenn.; College of Physicians and Surgeons, Memphis, 1907; formerly secretary of the Henry County Medical Society; on the staff of the McSwain Hospital; aged 52; died, in January.

Fred H. Williams ✠ Selma, Calif.; University Medical College of Kansas City, 1902; health officer of Selma; formerly on the staff of the Selma Sanitarium; aged 53; died, Dec. 8, 1928, of an accidental gunshot wound.

Marcus Edward Tully ✠ Glen Ridge, N. J.; Bellevue Hospital Medical College, New York, 1873; member of the Medical Society of the State of New York; aged 79; died, January 2, of cerebral hemorrhage.

William Warren Weaver, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1886; member of the Medical Society of the State of Pennsylvania; aged 64; died, January 3, of heart disease.

George William Reis ✠ Chicago; Harvey Medical College, Chicago, 1904; formerly on the staff of the Norwegian-Lutheran Deaconess Home and Hospital; aged 57; died, February 7, of lobar pneumonia.

Charles E. Thompson ✠ Covington, Ky.; Cincinnati College of Medicine and Surgery, 1885; aged 70; on the staff of the Booth Memorial Hospital, where he died, January 15, of pneumonia, following influenza.

Park L. Myers, Toledo, Ohio; Medical College of Ohio, Cincinnati, 1879; formerly dean and professor of chemistry and toxicology at the Toledo Medical College; aged 68; died, Dec. 19, 1928, of influenza.

Charles C. Kost, Dixon, Ill.; Missouri Medical College, St. Louis, 1889; member of the Illinois State Medical Society; past president and secretary of the Lee County Medical Society; aged 60; died, January 30.

John Thomas Krall ✠ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1894; aged 60; formerly on the staff of the Presbyterian Hospital, where he died in December, 1928.

Mayme Marshall Pile, Washington, D. C.; Woman's Medical College of Baltimore, 1884; member of the Medical Society of the District of Columbia; aged 80; died, February 8, of heart disease.

Lawrence Henry Grelle, St. Louis; St. Louis University School of Medicine, 1927; formerly intern, St. Mary's Infirmary, where he died, Nov. 29, 1928, of acute nephritis and lobar pneumonia.

Martin L. Somers, Altoona, Kan.; Hospital College of Medicine, Medical Department Central University of Kentucky, Louisville, 1884; aged 76; died, January 11, of cerebral hemorrhage.

George Berry Tate, Hollywood, Ala.; Medical Department University of Tennessee, Nashville, 1894; member of the Medical Association of the State of Alabama; aged 56; died, in January.

Jonas Rein Nilsen, New York; Medical Department of Columbia College, New York, 1881; member of the Medical Society of the State of New York; aged 83; died, February 4, of senectus.

Christopher W. Robertson, Somerville, Tenn.; Bellevue Hospital Medical College, New York, 1873; Confederate veteran; bank president; aged 80; died, January 20, of arteriosclerosis.

George Newton Lawson, Middle Haddam, Conn.; Yale University School of Medicine, New Haven, 1892; member of the Connecticut State Medical Society; aged 63; died, January 13.

Hiram C. Johnson ✠ Bruce, Wis.; Northwestern University Medical School, Chicago, 1900; secretary of the Rusk County Medical Society; aged 53; died, Dec. 10, 1928, of heart disease.

Richard J. Fleischer, Milwaukee; Milwaukee Medical College, 1895; member of the State Medical Society of Wisconsin; aged 65; died, January 16, of erysipelas and myocarditis.

Walter F. Morrison, Hanford, Wash.; Willamette University Medical Department, Salem, Ore., 1877; aged 79; died, January 2, at Seattle, of chronic myocarditis and arteriosclerosis.

George W. Jones, Huntsville, Ohio; Kentucky School of Medicine, Louisville, 1894; aged 67; died, February 7, at the Mary Rutan Hospital, Bellefontaine, of diabetic gangrene.

Harry Toulmin Lay, Denver; University of Virginia Department of Medicine, Charlottesville, 1904; served during the World War; aged 49; died, recently, of tuberculosis.

James Nelson Miller, Newton, N. J.; Medical Department of Columbia College, New York, 1881; aged 78; died, January 31, at the Seaside Hospital, Long Beach, Calif.

Francis Louis Benson ✠ Elmira, N. Y.; College of Physicians and Surgeons, Baltimore, 1910; aged 50; died suddenly, January 27, of chronic nephritis and myocarditis.

James J. Bolton, Williamsburg, Mo.; Eclectic Medical Institute, Cincinnati, 1860; Confederate veteran; aged 98; died, January 29, at the Masonic Home, St. Louis.

Henry Edmund Franck, Sacramento, Calif.; Cleveland Medical College, 1892; personal physician to the late President McKinley; aged 63; died, Nov. 28, 1928.

Francis Marion Hicks ✠ San Antonio, Texas; Bellevue Hospital Medical College, New York, 1880; aged 72; died, January 28, of chronic myocarditis.

James Harvey Cash ✠ Stillwater, Okla.; Beaumont Hospital Medical College, St. Louis, 1898; aged 67; died, February 1, of cerebral hemorrhage.

Isaac J. Brooks, Bearden, Tenn.; Medical College of Ohio, Cincinnati, 1882; aged 71; died, February 1, of cerebral hemorrhage and chronic nephritis.

Nathan Breiter ✠ New York; Medical Department of Columbia College, New York, 1888; aged 61; died, January 27, of carcinoma of the stomach.

Joseph Edgar Person, Pikeville, N. C.; College of Physicians and Surgeons, Baltimore, 1875; aged 77; died, January 21, of laryngeal tuberculosis.

Frederic George Maggs ✠ Stockton, Calif.; University of California Medical School, San Francisco, 1920; aged 36; died, Nov. 21, 1928, of pneumonia.

James D. Connor, Smoaks, S. C.; Medical College of the State of South Carolina, Charleston, 1881; aged 78; died, January 7, of heart disease.

Henry L. Fountain, Houston, Texas; Jefferson Medical College of Philadelphia, 1886; aged 62; died, Nov. 4, 1928, of cerebral hemorrhage.

Paul Joseph Klutz, Maiden, N. C. (licensed, North Carolina, 1885); aged 65; died, January 27, at Newton, of carcinoma of the stomach.

Luther E. McDougal, Eugene, Ore.; College of Physicians and Surgeons, Keokuk, Iowa, 1890; aged 77; died, February 1, of heart disease.

James R. Barton, Forest Park, Ga.; Atlanta College of Physicians and Surgeons, 1900; aged 61; died, Dec. 25, 1928, of pneumonia.

James L. Whittinghill, Evansville, Ind.; American Health University, Chicago, 1896; aged 56; died, February 6, of nephritis.

Paul N. Melchor, Fayetteville, N. C.; Leonard Medical School, Raleigh, 1890; aged 62; died, recently, of paralysis agitans.

Reuben H. Bryant, Asheville, N. C.; Leonard Medical School, Raleigh, 1889; aged 62; died, January 20, of heart disease.

James A. Anderson, Memphis, Tenn.; Memphis Hospital Medical College, 1887; aged 66; died, January 25, of heart disease.

William L. Underwood, Cropper, Ky.; Rush Medical College, Chicago, 1869; aged 79; died, January 17, of influenza.

Newton B. Bartholomew, Poland, Ind. (licensed, Indiana, 1897); aged 76; died suddenly, February 3, of angina pectoris.

Lawrence Thumser ✠ St. Louis; German University of Prague, Austria, 1891; aged 62; died, January 26, of pneumonia.

Norman H. Rahn ✠ Souderton, Pa.; Jefferson Medical College of Philadelphia, 1901; aged 55; died, February 6.

Usher L. Adams, Cleveland; Cleveland Medical College, 1897; aged 58; died, January 31, of heart disease.

Thomas L. Lee, Rochester, N. Y. (licensed, Indiana, 1901); aged 80; died, Dec. 13, 1928.

Bureau of Investigation

MORE DENTO-MEDICAL QUACKERY

A Pyorrhea Remedy and a "Synthetic Saliva" Preparation

As has been previously explained in this department of THE JOURNAL, the American Dental Association has turned its attention to the problem of giving its members and the public the facts regarding advertised medicinal preparations in the dental field. The national organization of dentists has a chemist, who has for some time been working in the Laboratory of the American Medical Association, which has placed its facilities and experience at the disposal of the dental organization. The work done in this field is made the subject of reports which are published in the official organ of the dental profession—the *Journal of the American Dental Association*. There have already appeared five reports of this character, three of which have been abstracted in this department of THE JOURNAL. The latest reports deal with "X-It," a pyorrhea remedy, and "Ora-Noid," said to be a "synthetic saliva" preparation. The X-It report appeared in the *Journal of the American Dental Association* for February, 1929, the Ora-Noid report in the March, 1929, issue of the same publication. What follows is an abstract of the essential facts given in the two reports published in the dentists' official organ:

X-It.—This preparation is put out by the X-It Laboratories of New York City and is advertised both to dentists and to the public. No information is given regarding the composition of the product, so that the dentist who uses it assumes the responsibility in applying a preparation about which he must know little. According to the newspaper advertising, the stuff is "recommended by over 14,000 dentists and physicians." Advertisements in dental journals are somewhat less exuberant; here we learn only that "hundreds of dentists" consider it the marvel that it is claimed to be.

ORAL HY
A CARD OF THANKS:
We extend our thanks to the thousands of dentists who have written us about their satisfactory experience in clinical tests of X-IT in cases of Pyorrhea, Gingivitis, Trench Mouth, and other gum troubles. If you have not tried it, and would like to, clip this advertisement, attach to your card or letterhead and an ample supply will be sent free
REG. U. S. PAT. OFF.
X-IT
X-IT LABORATORIES, INC.
142 East 32nd St. New York City

With each bottle of X-It comes an "X-It Massage Cup," a small rubber affair for rubbing X-It on the gums. Here is what the X-It Laboratories have to say about the composition of their preparation:

> "It is a liquid vegetable preparation worked out specifically for the prevention and treatment of pyorrhea and other germ diseases. It is the product of long and careful scientific and practical research, and has proven most effective in accomplishing its purpose."

The dental profession and the public are told that "X-It, like the normal saliva, is alkaline." Dentists, of course, know that the normal saliva is generally slightly acid. The chemist for the American Dental Association analyzed this product and some of the details of the analysis appear in the article published in its official journal. The facts brought out by the analysis are that X-It is, essentially, compound tincture of benzoin, with a small amount of zinc chloride dissolved in it, the whole being flavored with oil of wintergreen. Just how the manufacturers reconcile the presence in their product of zinc chloride with their claim that it is "a vegetable preparation," is not explained.

Ora-Noid.—The Ora-Noid Company of Chicago puts out this preparation and declares that "Ora-Noid may be roughly defined as a Synthetic Saliva." The chief men behind the Ora-Noid Company seem to be an attorney and a man connected with a furniture forwarding company. It is further claimed that Dr. Otto A. Keller of Chicago developed the Ora-Noid method and discovered "the ideal proportions in which to mix the various vegetables and mineral salts so as to build up the saliva to its highest potency." Just who Dr. Otto A. Keller is, is not clear. The files of the Bureau of Investigation of the American Medical Association have record of one Otto Keller of Chicago, who a few years ago was exploiting a "pyorrhea cure," using such trade styles as "Pyorrhea Institute of Illinois" and "International Pyorrhea Corporation." The last named concern in 1926 was selling "Zipco," another pyorrhea remedy.

The A. D. A. chemist analyzed Ora-Noid and attempted to determine how nearly true was the claim that Ora-Noid is a "synthetic saliva." He found, first, that Ora-Noid was strongly alkaline, in marked contrast to normal saliva, which is usually faintly acid. As normal saliva contains a starch-digesting enzyme, ptyalin, some tests were carried out to find out whether Ora-Noid would digest starch. It was found that, while a few drops of saliva would digest a given amount of starch in less than five minutes, Ora-Noid, under identical conditions, showed no digestion of starch in half an hour!

The chemist also found that Ora-Noid was essentially a mixture of table salt, baking soda, chalk, magnesia, starch and borax. It seems improbable that the contents of a can of Ora-Noid can cost more than ten cents; it sells for $2!

Correspondence

FEWER MEDICAL MEETINGS

To the Editor:—The editorial comment on "Fewer Medical Meetings" (THE JOURNAL, February 23) discusses an interesting phase of medical organization.

I fully appreciate how important staff meetings are, but I believe that there is a widespread lack of understanding of the proper correlation of the activities of local (county) medical societies and staff. This relation I have briefly discussed in a number of places; among them the last meeting of the House of Delegates of the American Medical Association and in the session on the hospital staff conference at the Annual Congress on Medical Education, Medical Licensure and Hospitals.

If the business material to be laid before the staff is properly prepared, there is no reason why an entire evening should be wasted in discussion on policy, which could be settled in a much shorter time and, I am certain, to the satisfaction of the great majority of staff members.

About three years ago I published an article on Hospital Clinical Conferences which was, I think, the stimulus for establishing a number of conferences in hospitals in Chicago, rural Illinois and Indiana. One of the important functions of this type of hospital activity is that if the conference functions properly it will not alone disseminate knowledge but will teach medical men to stand on their feet and talk, an ability which medicine wofully lacks. From this standpoint the conference should be a help to the local medical society.

Among the definite things which I outlined in my article was that the meetings should be held at a time of day when there would be no interference with regular medical societies. At that time I advocated 8 o'clock in the morning and I see no reason now why that is not the best hour, as it would probably be the first work the physician does when he leaves his home and would interfere less with office hours and regular work for the greatest number, of any time of the day, if it is granted that a day should extend from about 8 a. m. to 6 p. m. My contention of the importance of an early morning hour was

well borne out by the statement that a meeting of 160 men was held at Duluth, Minn., at 7 a. m. The clinical conference should be definitely limited in time (probably one hour) and should be closed at the scheduled time.

Formal papers should never be presented. The proper work of this type of conference consists of presentation of hospital statistics (probably once a month), presentation of pathologic material with case reports, or the definite showing of patients with an opportunity for general discussion.

There are so many ramifications of this subject that one can consider only a few basic principles in a letter. However, I should like to have those basic principles better understood by a large majority of medical men. If medicine is going to hold its present position (which is not so enviable), it seems important that more time and attention be given to the advancement of the local medical societies. There are numerous places in which hospital staff meetings are vying with the local medical societies when, as a matter of fact, the two should be mutually helpful to each other. G. HENRY MUNDT, M.D., Chicago.

"THE RELIEF OF PAIN BY NERVE SECTION"

To the Editor:—In my article "The Relief of Pain by Nerve Section" (THE JOURNAL, January 12), on page 121 at the bottom of the first column a statement is made concerning "chordotomy, since its original proposal by Frazier and Spiller." The references given are to reports by C. H. Frazier (*Arch. Neurol. & Psychiat.*, August, 1920) and C. H. Frazier and W. G. Spiller (*ibid.*, January, 1923).

I wish to modify this statement so that proper credit is given to Dr. Spiller for his proposal to section the anterolateral columns of the spinal cord for the relief of pain. The first case in which this procedure was carried through was reported by Dr. William G. Spiller and Dr. Edward Martin in THE JOURNAL, May 18, 1912, p. 1489.

Following this first case, Dr. Spiller suggested the procedure to Dr. Frazier, who elaborated the surgical technic which has made section of the anterolateral columns a practical procedure. The work of these two men was reported in the references mentioned in the text. However, as the context of my paper stands in THE JOURNAL, it would suggest that chordotomy was reported by Frazier and Spiller for the first time in 1920, which detracts from the proper credit due to Dr. Spiller for the report of the first case of chordotomy in man, which he described in 1912. FRANCIS C. GRANT, M.D., Philadelphia.

VIBRATORY MASSAGE OF PROSTATE

To the Editor:—In a recent communication (THE JOURNAL, Dec. 15, 1928, p. 1913) Dr. R. B. Rogers compared his method of applying vibratory massage to the prostate with the method described by me in THE JOURNAL (Nov. 3, 1928, p. 1371). I think it is but fair to point out certain differences between the two methods:

First, Dr. Rogers employs "an ordinary drug store vibrator" of a mechanical (not pneumatic) type, which provides a circular motion of the applicator on the second metacarpal. It is obvious that much of this vibration is lost before it reaches the finger tip in contact with the prostate. In the apparatus that I described, a high speed air compressor (oscillator) is used, which sends 8,000 "up and down" air vibrations a minute directly to the tip of the index finger in the rectum. There is no loss of vibrations as with the ordinary motor vibrator.

Second, Dr. Rogers increases or decreases the pressure of the finger on the prostate. In my report it was distinctly stated that no pressure whatever is used in my method, this being one of the particular advantages of vibratory over digital pressure massage. The adjustments on the oscillator permit full control of the intensity and frequency of the vibrations.

Third, as to the cost, which Dr. Rogers refers to, I prefer not to discuss this aspect except to say that the so-called physicians' model of the drug store vibrator retails in New York for $45, which is little less than what the oscillator outfit sells for. The difference in cost is practically nil when one considers the superiority of the custom-made oscillator over the commercial motor vibrator.

A. L. WOLBARST, M.D., New York.

RICHTER'S HERNIA

To the Editor:—In reading THE JOURNAL of January 26, page 342, I was particularly interested in the description by Dr. Robert L. Rhodes of the sensation of fulness or massing on palpation in a case of Richter's hernia. In none of his cases was a mass palpable.

Recently, I observed a patient with symptoms of intestinal obstruction. There was a vague sensation of fulness in the left inguinal region, but no mass was demonstrable by the ordinary methods of palpation. However, a mass was distinctly palpable by the use of the following method: The examiner stood on the patient's left (the side of the mass) and pressed the dorsum of the right hand gradually but firmly on the abdominal wall, parallel to and about two inches above Poupart's ligament. When the rectus had yielded, a firm but gradual cupping movement of the ulnar side of the hand toward the superior ramus of the pubis brought a distinctly palpable mass between the palpating hand and the pubis, just distal to the anterior superior spine of the ilium. By continuing the maneuver, the examiner could bring the mass sufficiently well forward to grasp it by the free hand. The mass was approximately the size of a small hen's egg and was not tender. There was no similar palpatory finding on the right side. It was thought to be a carcinoma of the sigmoid, but no explanation could be found for its impalpability by the usual methods. Laparotomy was performed and showed a Richter's hernia in the left internal inguinal ring. Apparently to palpate such masses one must give them a cloak of the abdominal wall.

ARTHUR N. FOXE, M.D., New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

THE NINHYDRIN TEST IN PREGNANCY

To the Editor:—Kindly give method of using ninhydrin in making urine test for early pregnancy.

WILLIAM A. PEEK, M.D., Helena, Mont.

ANSWER.—Ninhydrin is triketo hydrindene hydrate. The general method of using this test is as follows: Ten cubic centimeters of the material to be tested is mixed with 0.2 cc. (some authors have used 0.3 and 0.5 cc.) of a 1 per cent aqueous solution of ninhydrin. The mixture is heated to boiling and kept boiling for one minute. A distinct blue color appears when the test is positive. The test gives positive results with proteins, peptones, polypeptides and amino-acids, which possess a free carboxyl and α-amino group.

The biologic test for pregnancy as carried out by Abderhalden is as follows (N. N. R., 1918):

About 1 Gm. of coagulated placental tissue is boiled with ten times its volume of water, and the water poured off and this treatment repeated until the liquid contains nothing that will give a reaction with ninhydrin. When it no longer responds to the ninhydrin test it is placed in a diffusion cell with 0.65 cc. of blood serum free from hemoglobin and the mixture is allowed to diffuse into 20 cc. of distilled water. Both the dialysate and the liquid in the cell are covered with a layer of toluene. The dialysis is continued for from twelve to sixteen hours in the incubator at a temperature of 37 C.

To 10 cc. of the dialysate, 0.2 cc. of a 1 per cent aqueous ninhydrin solution is added and the test performed as described. If a blue color results, the serum has been derived from a case of pregnancy.

The Abderhalden reaction, however, has fallen into disrepute. As long as eight years ago, Smith and Shipley showed that while the natural ferments present in serum are somewhat increased there is no evidence that a specific ferment exists in pregnancy. The tests on the serum of pregnant women are uniformly positive, but the large number of positive results on the serums of men and nonpregnant women proves the test of no value for the diagnosis of pregnancy.

Even students of Abderhalden were forced to come to the conclusion adverse to the widely heralded Abderhalden reaction, as was pointed out in an editorial in THE JOURNAL, Dec. 25, 1920, p. 1786. Wells, who also had much experience in the study of this alleged reaction, has pointed to the "absolutely nonspecific and hopelessly paradoxical results" so frequently recorded.

The textbook of De Lee on Principles and Practice of Obstetrics (ed. 5, 1928) states that the test is very delicate and specificity is not proved; that it is of no practical obstetric value at present, but that the proof that fetal elements exist in the maternal blood is of great physiologic and clinical significance.

In Europe there are still some contenders for the ninhydrin reaction even today. Dienst, in a series of tests, states that the ninhydrin reaction as applied to the urine may be as reliable for the diagnosis of pregnancy as when made with blood serum. However, this method is subject to considerable interpretation.

The ninhydrin test described by Dienst is based presumably on the difference in the thrombin and combined thrombin in the normal and pregnant condition. The amount of metathrombin (i. e., combined thrombin) had been found by Dienst to be correlated with the length of pregnancy. Applying the ninhydrin test described below on the urine of pregnant women, Dienst found that the resulting color increases in intensity until about the end of pregnancy. Yet, the intensity of the color falls off remarkably two days before term, and the color is completely absent during labor and the postpartum period. The test has been found 96 per cent successful (forty-three out of fifty cases).

Catheterized urine must be used for the test, and early morning specimen is preferable; the urine taken later in the day is generally accompanied by fats and nitrogen compounds which interfere with the test. If necessary, however, the test may be carried out on this urine, but the interpretation of the result is complicated by these factors. Leukocytes also interfere with the test. The urine drawn from women in the premenstrual period gives a color reaction equivalent to about the fourth week of pregnancy, when 0.3 cc. of ninhydrin is used. This is overcome by using only 0.1 cc. of reagent, when the differentiation is complete. The amount of ninhydrin solution is thus an important factor.

The test is as follows: Three separate portions of 10 cc. of catheterized urine is boiled for twenty-five seconds by stop watch with 3, 2 and 1 mg., respectively, of ninhydrin (0.1 cc. of a 1 per cent aqueous solution contains 1 mg.); all test tubes should be of Jena glass (18 cm. long and 0.75 cm. wide). The tube is held vertical and the liquid allowed to boil as in the boiling of milk for one second. The liquid is then transferred to sterile tubes (as nearly alike as possible made of glass without green color), and closed with cotton. On cooling, the color appears. In order to avoid the different intensities of light, the color is read in the dark by means of an electric light. If a distinct lilac color appears when 0.1 mg. of ninhydrin is used, there is no doubt as to pregnancy. One finds in the urine of pregnant women on the addition of 0.2 cc. of ninhydrin solution an intensive violet coloration, while under normal conditions or in toxic pregnancy the reaction with 0.2 cc. of ninhydrin solution entirely fails, and even with the addition of 0.3 cc. of ninhydrin it is only weakly violet in color; while with the addition of 0.3 cc. of ninhydrin to the urine of normal pregnant women, the coloration is violet blue violet. One must always guard against premenstrual and postmenstrual colors, as explained. The test is negative in eclampsia.

In view of the complications and the character of the ninhydrin reaction in general, the test on urine does not appear promising, and should not be trusted until there is confirmation from other sources.

A preliminary report on the Aschheim-Zondek hormone test for pregnancy appeared in THE JOURNAL, Dec. 22, 1928, p. 1988, which, according to Louria and Rosenzweig, shows a positive reaction in 98 per cent of cases. The test requires the use of mice and the services of one trained in pathology.

QUININE IDIOSYNCRASY

To the Editor:—Can you give me the best technic in trying out a suspected quinine idiosyncrasy with least danger to the patient?

JOSEPH S. MAXWELL, Monmouth, Ill.

ANSWER.—In such cases the "fractional dose" method is best. It consists in giving the patient 0.06 Gm. (1 grain) of quinine sulphate per hour, 0.12 Gm. (2 grains) every two hours, day and night. Then, on the appearance of alarming effects, the dosage may be promptly discontinued. Mere ringing in the ears or other mild symptoms of cinchonism, however, should not be considered adequate indication for cessation of dose or guide to quantity, as it is not a certain effect on the patient but an effect on the parasites that is aimed at. When fractional doses are given, it is especially important to administer the drug during the night, as it is only thus that the blood may be sufficiently charged with quinine during the day, the time when sporulation usually occurs.

USE OF DICK TEST AND ANTISCARLET FEVER PREPARATIONS

To the Editor:—One of the antitoxin laboratories advises that it is not issuing scarlet fever antitoxin for creating passive immunity, for reasons purely commercial. Is it not still advisable to administer injections to children showing a positive Dick test, just as it is to give toxin-antitoxin to children with a positive Schick test?

ROBERT H. BROOKS, M.D., Claremont, N. H.

ANSWER.—In the question, there seems to be some confusion between preparations of scarlet fever toxin for active immunization and the prophylactic dose of antitoxin for passive, temporary protection.

Prophylactic scarlet fever antitoxin, like other antitoxins, is a horse serum preparation. It should be used only in those persons who are susceptible and already infected so that they are in danger of developing scarlet fever at once. The protection conferred by the prophylactic dose of antitoxin, like the protection conferred by prophylactic doses of diphtheria antitoxin, is transient. It cannot be expected to last more than from ten days to two weeks. On subsequent exposure, the patient may contract scarlet fever.

Scarlet fever toxin does not contain horse serum. It should be used in five graduated doses for active immunization of susceptible persons who do not already have scarlet fever. It has been determined that the immunity thus obtained lasts a period of years. Children who show a positive Dick test are being immunized with the five graduated doses of toxin in many institutions, schools and communities.

TREATMENT OF ITCHING IN JAUNDICE

To the Editor:—Kindly inform me as to the specific relief of the itching in jaundice. I understand that there is one drug that is specific, but its name has slipped my mind and I have no means of finding it at present.

HAROLD I. GOSLINE, M.D., Ossining, N. Y.

ANSWER.—There is no other specific for the relief of the itching of jaundice than to get rid of the jaundice. The next most efficient measure, acting probably by favoring elimination of the bile salts responsible for the itching, is not only the liberal ingestion of fluid by mouth but also the slow rectal injection, even rectal drip, once or twice daily of 1 liter of water with the addition of 5 per cent dextrose to render it isotonic. Pilocarpine nitrate, in doses of from 5 to 10 mg., by mouth or subcutaneously, and repeated so as to maintain a mild diaphoresis, is more nearly a specific drug than any other, as it may not only relieve the itching by antagonizing the abnormal dryness of the skin, but also might, by increasing biliary mucous secretion, favor relief of the obstruction. Otherwise, sponging with hot solutions of sodium bicarbonate followed by dusting with talcum powder, or the application of 1 per cent menthol in alcohol, may have to be resorted to; this may be coupled, if required, with the use of sedatives, such as phenobarbital, especially at bedtime, as the itching is most intolerable at night. Morphine is strictly tabu.

HAZARDS OF THE PETROLEUM INDUSTRY

To the Editor:—I have the employees of a refining plant under my care from time to time. At this plant they employ a cracking process, and they make ethyl gas, ordinary gasoline and kerosene. Occasionally one of the men seems to get overcome. Can you inform me as to the management of such cases, other than the general supportive treatment? Would an oxygen tank kept at the plant for first aid be of any value? There are hydrogen sulphide fumes as well as fumes of sulphuric acid in the air to a greater or lesser degree all the time. In the past six months I have had two men with what I have thought to be gas poisoning. These men work in the open but have to climb up on large tanks to gage them. This particular group is dealing largely with hydrogen sulphide. I should like to know if there is a specific treatment for hydrogen gas poisoning. What can we do to lower the hazard? What can I do to prove what gas is really at fault?

LESLIE H. WINANS, M.D., Ashland, Ky.

ANSWER.—The refining of crude petroleum may introduce such a variety of hazards that only meagerly may any be discussed in this department. From the language of the query it may be inferred that tetra-ethyl lead is not the responsible agent in the cases mentioned. Three other conditions are more likely: (1) "naphtha jags" from the gasoline, naphtha, and kindred products; (2) anoxemia due to the replacement of

oxygen of the air by some other gas in the refinery; (3) hydrogen sulphide intoxication.

1. "Naphtha jags" represent the acute stage of systemic petroleum intoxication. There is a rare chronic form similating a psychotic state. The acute condition manifests itself much as acute alcoholism. Even the mildly affected are talkative, foolish, laugh excessively without provocation, and become unreasonable and quarrelsome. The chronic cases (apart from the severe mental aberration) may present a great diversity of symptoms ranging from vertigo and insomnia to vomiting and anemia. Adequate data may be found in *Public Health Reports* **37**:38 (Sept. 22) 1922. The mental types are bizarre. The onset is commonly by sudden unconsciousness and vomiting. Recovery appears to take place if removal from the danger area is secured. Actually, recurring attacks of unconsciousness take place at long intervals, and slowing down of physical and mental processes occur. In one case a daily trip ordinarily requiring fifteen minutes required ninety minutes after affliction. Also marked somnolence with periods of insomnia, perversions of taste and loss of memory occur. These mental disturbances are frequently accompanied by a hepatitis. With or without treatment these petroleum intoxicated workers seem to clear up gradually over a period of months, provided exposure is controlled.

2. When the oxygen content of the air is much lowered by admixture of other gases, however inert they may be of themselves, workmen therein will suddenly become unconscious and respiration will fail. Removal from the harmful region and the institution of manual artificial respiration are called for.

Breathing machines are not desirable, are not always immediately available, and some exert traction on lung tissues. The H.-H. inhalator is not a breathing machine but a gas supplying machine to be used in connection with manual artificial respiration for the stimulation of natural breathing.

3. Of the two gases mentioned in the query, hydrogen sulphide is far more likely to be the harmful agent. Hydrogen sulphide is toxic in concentrations of 0.01 per cent, and may be found around petroleum operations in concentrations of from 10 to 15 per cent (by volume). This substance resembles hydrocyanic acid in its rapid action on the blood in low concentration. It is both irritating and asphyxiating. Sudden unconsciousness among petroleum workers is more often attributable to this gas than to any other industrial cause. This gas may produce (1) local action, such as eye irritation, which ranges in severity from mild conjunctivitis to swelling and bulging of the conjunctivae, photophobia, and temporary blindness and ulceration; (2) acute systemic intoxication characterized by unconsciousness, failure of respiration and quick cessation of the heart beat (four to eight minutes); if immediate recovery is obtained, this stage may be followed by bronchopneumonia, bronchitis or pulmonary edema; (3) chronic manifestations, such as low grade conjunctivitis, mucous membrane irritation, bradycardia, headache, and gastro-intestinal upsets. This chronic form of the disease arises when prolonged exposure is provided to concentrations around 0.01 per cent.

The diagnosis of hydrogen sulphide poisoning may not at the present time be secured through laboratory measures. The belief that hydrogen sulphide combines with the hemoglobin to form sulphemoglobin may not be tenable. Aids to the diagnosis of the condition are:

(*a*) Determination of hydrogen sulphide in harmful concentrations at the exposure point, it being remembered that the odor commonly associated with this gas is not found in high concentrations, under which conditions the odor resembles chlorine or hydrochloric acid.

(*b*) The occurrence of a fulminating asphyxiation with quick cessation of the heart beat, the entire condition usually without prodromes.

(*c*) Extent of involvement of the eyes frequently out of proportion to the involvement of similar tissues.

The treatment for acute hydrogen sulphide asphyxiation largely centers about artificial respiration, after removal from the gas area. Artificial respiration should be started immediately, the prone pressure method being used and any mechanical device that produces traction on lung tissues being avoided.

Treatment of serious eye lesions should include the use of local anesthetics of types that do not favor the occurrence of ulceration, the use of silver proteinates, the use of mild ointment such as 1 per cent yellow oxide, and hot and cold compresses, if pain is severe.

In order to lower the hazard of hydrogen sulphide, the following steps are suggested:

A. The concentration of hydrogen sulphide in the air should be tested by standard methods in order that the actual amounts may be known.

B. The extent of the hazard should be limited at the source as far as possible by spot suction and by room-forced ventilation.

C. Workmen should be instructed to avoid the gas whenever possible by working on the windward side wherever the gas is escaping.

D. Canister masks should be worn whenever the concentration of gas is in the lower harmful ranges. If the concentration is known to be very high, hose masks should be employed.

E. If eye protection is necessary, gas-proof goggles should be worn, of the type overcoming fogging of the lenses.

F. All workmen should be educated as to the dangers of hydrogen sulphide gas and measures of protection.

The following articles may be consulted:

Yant, W. P., and Fowler, H. C.: Hydrogen Sulphide Poisoning in the Texas Panhandle, Big Lake, McCamey Oil Fields, Texas, pub. 2776, Bureau of Mines, October, 1926.

Haggard, H. W.: Toxicology of Hydrogen Sulphide, *J. Indust. Hyg.* **7**:113 (March) 1925.

DIGITALIS INTRAVENOUSLY — RHEUMATIC NODULES

To the Editor:—1. Please give me the intravenous dose of digitoxin as best given for prompt, efficient digitalization of a patient with acute cardiac decompensation. Is it considered dangerous to give such dosage? 2. We have had in our wards a case the diagnosis of which has much puzzled me. The patient was a woman of about 40. She complained of pains of a rheumatic type occurring in small nodules that appeared and disappeared in various parts of the subcutaneous tissue all over the body but chiefly in the arms. She came to the clinic twice before I discovered any of these nodules. Each time she pointed out where they had been just before the examination but they had disappeared by the time I saw her. In the wards later I myself marked these small nodules. There was extreme pruritus over the area and the nodule itself was painful and tender. It usually disappeared within from one to six hours. The patient also complained of burning in the palms of the hands and soles of the feet. We treated her with large doses of sodium monomethylarsenate, intravenous salicylates, protein shock, and injections of incubated blood. The last seemed to be most effective in ridding her of the nodules. She still complained, however, of burning in the hands and feet when she left. WILLIAM L. NUTE, M.D., Adana, Turkey.

ANSWER.—1. There is no perfectly satisfactory digitalis preparation for intravenous use. Digitoxin has the disadvantage of being nearly insoluble in water, requiring at least 25 per cent of alcohol for solution. The dose is given at from 0.25 to 1 mg. Strophanthin (ouabain) is the most satisfactory digitalis body for intravenous use. A digitalis-free patient may be given 0.5 mg. in from 3 to 5 cc. of physiologic solution of sodium chloride, at six hour intervals for two or three doses if required. Such dosage is dangerous, if the patient has been given digitalis within three days previously.

2. The nodules described are evidently the so-called rheumatic nodules, consisting of the inflammatory reaction around local deposits of diplococci in the subcutaneous tissue. The treatment should include, in the first place, eradication of the focus of infection from which the microbic showers originate. The attempt should, secondly, be made to increase resistance; the success of injections of blood proteins may be ascribed to this mode of action. The symptomatic use of salicylates is also not to be despised.

CALCIUM CARBONATE FOR ALKALIZATION OF URINE

To the Editor:—It is believed by many clinicians that sodium bicarbonate is the best preparation to alkalize the urine. How efficient is calcium carbonate for the purpose? What is the relative dosage of calcium carbonate and sodium bicarbonate to produce the same result? Please omit my name. M.D., Illinois.

ANSWER.—Both sodium bicarbonate and calcium carbonate are effective antacids as far as the gastric secretion is concerned. However, sodium bicarbonate is much more efficient in aiding in the alkalization of the urine than calcium carbonate. The reason for the difference lies in the fact that sodium salts, such as bicarbonate, are freely absorbed by the intestine. On the other hand, calcium carbonate itself is not susceptible of absorption; in fact, the soluble salts are absorbed with great difficulty in the intestine and stomach and retard the absorption of the fluid. The greater portion of the calcium compounds taken either with food or as a remedy unquestionably leaves the body in the stools unabsorbed; while a smaller quantity is taken up from the alimentary canal, whether the calcium compound is administered in soluble or insoluble form. The sodium salts in the blood are relatively easily eliminated by the kidneys, whereas salts of calcium (particularly bicarbonate and combinations with proteins) are slowly excreted. Sodium bicarbonate may be freely used to the extent of actual alkalization of the urine, though it may take as much as 30 Gm. or more to do it.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

CALIFORNIA—Reciprocity: San Francisco, March 13, 1929. Sec., Dr. Charles B. Pinkham, Board of Medical Examiners, 420 State Building, Sacramento, Calif.

CONNECTICUT: Hartford, March 12-13, 1929. Sec., Dr. Robert L. Rowley, 79 Elm Street, Hartford, Conn.

CONNECTICUT—Homeopathic: New Haven, March 12, 1929. Sec., Dr. Edwin C. M. Hall, Homeo. Medical Examining Board, New Haven, Conn.

DISTRICT OF COLUMBIA: Washington, April 9, 1929. Sec., Dr. Edgar P. Copeland, Suite 110—1801 Eye Street, Washington, D. C.

IDAHO: Boise, April 2, 1929. Hon. Fred. E. Lukens, Commissioner of Law Enforcement, Medical Examining Board, Boise, Idaho.

ILLINOIS: Chicago, April 9-11, 1929. Supt. of Registration, Mr. V. C. Michels, Dept. of Registration and Education, Springfield, Ill.

MAINE: Portland, March 12-13, 1929. Sec., Dr. Adam P. Leighton, Board of Registration of Medicine, 192 State House, Portland, Me.

MASSACHUSETTS: Boston, March 12-14, 1929. Sec., Dr. Frank M. Vaughan, Board of Registration in Medicine, 144 State House, Boston, Mass.

MINNESOTA—Basic Science: Minneapolis, April 2, 1929. Sec., Dr. E. T. Bell, 110 Anatomy Bldg., University of Minnesota, Minneapolis.

MONTANA: Helena, April 2, 1929. Sec., Dr. S. A. Cooney, State Capitol Building, Helena, Mont.

NEW HAMPSHIRE: Concord, March 14-15, 1929. Sec., Dr. Charles Duncan, State Medical Board, State House, Concord, N. H.

NEW MEXICO: Santa Fe, April 8-9, 1929. Sec., Dr. W. T. Joyner, 20-21 First National Bank Building, Roswell, N. M.

OKLAHOMA: Shawnee, March 12-13, 1929. Sec., Dr. J. M. Byrum, Board of Medical Examiners, Shawnee, Okla.

ADDITIONAL HOSPITALS AND LABORATORIES APPROVED

The Council on Medical Education and Hospitals of the American Medical Association at a recent meeting gave its approval to additional hospitals and clinical laboratories, as follows:

Hospitals Approved for Intern Training:

James M. Jackson Memorial Hospital, Miami, Fla.
St. Mary's Hospital, East St. Louis, Ill.
Bethany Methodist Hospital, Kansas City, Kan.
St. Mary's General Hospital, Lewiston, Me.
Mercy Hospital, Bay City, Mich.
St. Joseph Mercy Hospital, Detroit.
St. Anthony's Hospital, St. Louis.
Lincoln Hospital, Durham, N. C.
Woman's Hospital, Cleveland.
Windber Hospital, Windber, Pa.
U. S. Naval Hospital, Bremerton, Wash. (Affiliation).

Hospitals Approved for Residencies in Specialties:

Connecticut State Hospital, Middletown, Conn.
Gallinger Municipal Hospital, Washington, D. C.
Steiner Cancer Clinic, Atlanta, Ga.
Grady Memorial Hospital (Col. Unit), Atlanta, Ga.
Cook County Psychopathic Hospital, Chicago.
West Suburban Hospital, Oak Park, Ill.
Rockford Municipal Sanitarium, Rockford, Ill.
Mercy Hospital, Baltimore.
Gardner State Colony, Gardner, Mass.
Pondville Hospital, Wrentham, Mass.
State Psychopathic Hospital at the University of Michigan, Ann Arbor, Mich.
Blodgett Memorial Hospital, Grand Rapids, Mich.
Newark City Hospital, Newark, N. J.
Brooklyn State Hospital, Brooklyn.
Manhattan State Hospital, New York.
Cincinnati Sanitarium, Cincinnati.
Ohio State Sanatorium, Mount Vernon, Ohio.
Doernbecher Memorial Hospital for Children of the University of Oregon Medical School, Portland, Ore.
Hospital of the University of Pennsylvania, Philadelphia.
Western State Hospital, Bolivar, Tenn.
San Antonio State Hospital, San Antonio, Texas.
St. John County Hospital, East St. John, N. B.

Clinical Laboratories Approved:

The Hennemeyer Laboratories, R. J. Hennemeyer, M.D., Director, Chicago.
M. M. Matthies Laboratory, Inc., M. M. Matthies, M.D., Director, Chicago.
Clinical Laboratory of Manuel G. Gichner, M.D., Baltimore.
Laboratory of Albert E. Steele, M.D., Boston.

Complete lists of approved hospitals and clinical laboratories, including the foregoing additions, will appear in THE JOURNAL, March 30.

Connecticut November Examination

Dr. Robert L. Rowley, secretary of the Connecticut Medical Examining Board, reports the written examination held at Hartford, Nov. 13-14, 1928. The examination covered seven subjects and included 70 questions. An average of 75 per cent was required to pass. Of the 31 candidates examined, 30 passed and one failed. The following colleges were represented:

College	Year Grad.	Per Cent
PASSED		
Yale University School of Medicine	(1926)	82.8, 85.5, (1927) 77.2, (1928) 79.7, 80.5, 82.8, 86.4, 86.6
Howard University School of Medicine	(1927) 75.0, (1928)	75.0
University of Maryland School of Medicine and the College of Physicians and Surgeons	(1928)	80.1
Johns Hopkins University School of Medicine	(1926)	81.6
Harvard University Medical School	(1927)	81.4
Tufts College Medical School	(1927)	84.1, (1928) 77.1, 78.4, 80.7, 81, 81.3
Columbia Univ. Coll. of Phys. and Surgs.	(1926) 83.6, (1927)	81.5
University of Pennsylvania School of Medicine	(1927)	82.8
University of Vermont College of Medicine	(1928) 78, 78.9, 79.3,	81.5
Queen's University Faculty of Medicine	(1926)	75.2
McGill University Faculty of Medicine	(1926)	84.3
University of Montreal Faculty of Med.	(1924) 76.2, (1925)	75.4
FAILED		
St. Louis University School of Medicine	(1927)	71.6

Dr. Rowley also reports 13 physicians licensed on endorsement of credentials as of Dec. 4, 1928. The following colleges were represented:

College	Year Grad.	Reciprocity with
LICENSED BY RECIPROCITY		
Emory University School of Medicine	(1918)	Georgia
State University of Iowa College of Medicine	(1923)	Iowa
Bowdoin Medical School	(1907)	Mass.
Johns Hopkins University School of Medicine	(1921)	N. B. M. Ex.
(1924) Maryland		
Harvard University School of Medicine	(1923)	N. B. M. Ex.
Columbia University College of Phys. and Surgs.	(1921)	New York
University and Bellevue Hosp. Med. Coll.	(1909), (1922)	New York
Ohio State University College of Medicine	(1921)	Ohio
University of Texas School of Medicine	(1925)	New York
University of Vermont College of Medicine	(1925)	Vermont
University of Western Ontario Medical School	(1913)	Michigan

Maine November Examination

Dr. Adam P. Leighton, Jr., secretary of the Maine State Board of Registration of Medicine, reports the written examination held at Portland, Nov. 13-14, 1928. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Of the three candidates examined, two passed and one failed. Three physicians were licensed through reciprocity with other states. The following colleges were represented:

College	Year Grad.	Per Cent
PASSED		
Tufts College Medical School	(1928)	85
University of Pennsylvania School of Medicine	(1918)	84
FAILED		
University of Naples, Italy	(1927)	61.6

College	Year Grad.	Reciprocity with
LICENSED BY RECIPROCITY		
University of Pennsylvania School of Medicine	(1916)	Penna.
University of Vermont College of Medicine	(1928) (2)	Vermont

Kentucky December Examination

Dr. A. T. McCormack, secretary of the Kentucky State Board of Health, reports the written examination held at Louisville, Dec. 4-6, 1928. The examination covered 11 subjects. An average of 75 per cent was required to pass. Two candidates were examined and passed. Two physicians were licensed through reciprocity with other states. The following colleges were represented:

College	Year Grad.	Per Cent
PASSED		
University of Louisville School of Medicine	(1928)	83.0
Harvard University Medical School	(1925)	86.0

College	Year Grad.	Reciprocity with
LICENSED BY RECIPROCITY		
University of Louisville School of Medicine	(1909)	Indiana
Louisville Medical College	(1907)	Arkansas

Book Notices

NOUVEAU TRAITÉ DE MÉDECINE. Par G. H. Roger, Fernand Widal, et P. J. Teissier. Fascicule XVI: Pathologie du foie et des voies biliaires. Sémiologie: physique (Maurice Villaret, et L. Justin-Besançon); fonctionelle (Marcel Garnier). Syndromes: insuffisance et suractivité fonctionelles (M. Garnier), etc., etc. Boards. Price, 125 francs. Pp. 1048, with illustrations. Paris: Masson & Cie, 1928.

In this number, a satisfactory chapter on the physical and functional examination of the liver is followed by an almost classic study of the hepatic syndromes: insufficiency and overaction, portal hypertension and icterus. Among the diseases of the liver, hepatic cirrhosis is dealt with at particular length. In its etiology, alcoholism is given first place, but merely as a predisposing cause which lessens the resistance of the hepatic parenchyma and thereby favors localization in it of chronic infection, the liver cells presenting as they do the first obstacle to systemic invasion from the alimentary tract and also serving in defense against other infections, particularly syphilis. In view of the importance of early diagnosis, while it is still curable—especially if syphilitic by means of mercury, bismuth and iodide—certain urinary tests, elaborated chiefly by the French, capable of revealing the preascitic stage of cirrhosis, should be more generally known in this country. Typical among these is opsiuria, a delay in the urinary excretion maximum of ingested material. When it is possible to eliminate gastric, cardiac or renal causes for opsiuria, its occurrence points directly to the diagnosis of portal obstruction. Hepatic opotherapy, especially by injection but also by mouth, is favorably spoken of as a remedy in hepatic insufficiency. In amebic abscess of the liver the curative value of emetine is considered incontestable, and careful directions are given as to dosage on hypodermic administration. Intramuscular injection of emetine is more painful; intravenous injection, too dangerous. Only in the early stages is it completely successful. Acetarsone is also favorably spoken of, but it is less powerful than emetine. The giving of intravenous injections of acetarsone in alternation with hypodermic injections of emetine has produced encouraging results. After the limit of safe dosage of these remedies has been reached, however, and considerable swelling of the liver still remains, surgical evacuation of the pus should be resorted to. Cholelithiasis is believed to be always a double process; a local biliary one, septic or aseptic, resulting in the precipitation of pigment, and a systemic disturbance of the cholesterol metabolism. One cannot agree, in view of contrary experimental and clinical evidence, with the idea expressed that methenamine is a biliary antiseptic and, as such, useful in these cases. One cannot help being somewhat disappointed, in view of the extensive consideration given the pathologic and clinical features, that therapeutics does not receive more adequate consideration. One misses, for instance, statistical studies of therapeutic results and more detailed directions as to diet and therapeutic technic, and notes with regret that obsolete remedies are mentioned without critical scrutiny. There is no volume index, a decided inconvenience in a work as large as this.

THE RESPIRATORY FUNCTION OF THE BLOOD. Part II: Hæmoglobin. By Joseph Barcroft. Cloth. Price, $5. Pp. 200, with 63 illustrations. Cambridge: University Press, 1928.

Fifteen years ago the first edition of "The Respiratory Function of the Blood" was published. Although the reaction of oxygen with hemoglobin and the factors modifying this reaction comprised the major portion of the book, the physiologic consequences of high altitudes and factors concerned with the passage of oxygen to and from the blood also were discussed. Since the material presented fell logically into three parts, and since knowledge in each major division has increased greatly in the interim, Barcroft has wisely divided the second edition into three separate monographs. The first volume, "Lessons from High Altitudes," appeared in 1925 and dealt with the physiologic consequences of living at high altitudes. The present volume attempts to bring down to date the chemical, physicochemical and physiologic knowledge concerning "the second most interesting substance in the world," together with those of its near and distant relatives. The anticipation that this volume might be of interest only to those who have made the respiratory pigments their special study is not borne out. Barcroft's intimate manner of recital imparts to the book the flavor of a red blooded adventure. Even more than in the first edition, the reader gains the impression that he is permitted a share in the disappointments, successes, perplexities and surprises of the laboratory adventures of Barcroft and his crew. Of the seventeen chapters, three are devoted to a description of the relation now thought to exist between hemoglobin, its precursors and its derivatives. The most interesting change in point of view resulting from investigations on hemoglobin problems in the last ten years is illustrated by the fifth chapter, on the specificity of hemoglobin. At the time of the first edition, physiologists were inclined to stress the similarity of hemoglobins wherever and whenever found; the impression today is that, species specificity in hemoglobin having been demonstrated, individual differences within species may also be demonstrable. Much entertaining discussion follows on what might be termed the colloidal aspects of hemoglobin, the molecular weight, the osmotic pressure, the degree of aggregation, and the solubility. The last half of the book is devoted to a discussion of those phases of the hemoglobin problem with which Barcroft has been personally identified: the equilibrium between hemoglobin, oxygen and carbon monoxide. On completing this portion of the book, one feels that, whereas ten years ago, with improvement in experimental methods, the answer to all the questions concerned with oxygen and carbon monoxide dissociation curves lay just around the corner, now, experimental success has been crowned with theoretical bewilderment.

ABHANDLUNGEN AUS DEM GESAMTGEBIETE DER HYGIENE. Herausgegeben von Dr. R. Grassberger, o. ö. Professor der Hygiene in Wien. Heft 2. 1: Über die Grundlagen der Beurteilung von Milchverfälschungen. (Nach einem am 13. Jänner 1927 in der Österr. Kriminalistischen Vereinigung gehaltenen Vortrage.) Von Ernst Krombholz. II: Über die Schwierigkeiten vei der gerichtlichen Verfolgung von Lebensmittelverfälschungen und insbesondere von Milchverfälschungen. (Nach einem im Mai 1927 in der Österr. Kriminalistischen Vereinigung gehaltenen Vortrage.) Von Staatsanwalt Wladimir Fikeis. Paper. Price, 6 marks. Pp. 87. Leipzig: Franz Deuticke, 1928.

This monograph contains a discussion of the principles involved in the detection of the adulteration of milk and a general discussion of the difficulties, particularly those of a legal character, involved in the prosecution of those attempting to practice the adulteration of milk. Valuable data concerning the variations encountered in the constituents of milk are included. The author seems to feel that the prosecution of milk distributers for the adulteration of milk is more or less a farce since it is difficult to prove adulteration and when this is done the real culprit often escapes.

A TEXT-BOOK OF PATHOLOGY. By W. G. MacCallum, Professor of Pathology and Bacteriology, the Johns Hopkins University. Fourth edition. Cloth. Price, $10 net. Pp. 1177, with 606 illustrations. Philadelphia: W. B. Saunders Company, 1928.

This textbook appeared first in 1916. There is no need now for some of the suggestions contained in former reviews (THE JOURNAL, Sept. 16, 1916, p. 899; Jan. 29, 1921, p. 332; May 16, 1924, p. 1517). The author frankly stated in the preface to the first edition that it was not designed as a work of reference and that no attempt was made to follow the usual arrangement in similar works, of subdivisions based on anatomic construction. Although the original design has been followed closely, the improvements with each revision have certainly made the book of use for reference purposes and in some respects there are definite indications of grouping the diseases by viscera. After the principles of disease commonly included under general pathology and occupying about one fifth of the work are discussed, most of the important diseases are reviewed. They are grouped, so far as possible, on the possession of something in common in their etiology. The word injury to most physicians and medical students means external violence. As it is used in "types of injury" for the heading of many chapters, it refers to conditions with which trauma has no part. The author states that in this fourth edition "a very complete revision has been attempted." It has also been accomplished.

There is no difficulty in detecting where the omission of some sections and the condensation of others have gained about thirty pages. Discussions of the acid-base equilibrium, of the conduction system of the heart and arrhythmias due to its

disease, and of the side-chain theory of immunity and reactions due to immune-bodies, such as precipitins, are omitted in this revision. Amyloid disease, metaplasia and carbohydrate metabolism are now presented much more concisely. Many paragraphs of former editions now lack one or more sentences of less significance. Sternberg's classification of the hyperplasias of lymphoid tissue, Ribbert's theory of tumor genesis, and a rather lengthy discussion of tuberculous granulation tissue and acute tuberculous inflammation have been omitted. Some rearrangement has been effected by moving considerations of influenza, syphilis of the blood vessels, cretinism and chondrodystrophia fetalis to more appropriate places. A modern trend, now well established, of changing the diphthong ae to e in such words as anaemia and the "ata" ending for tumors to "as" will probably be followed in some future editions. It is certainly not easy to see what principles have governed paragraphing of the text.

Space does not permit enumeration of the many sections largely or entirely rewritten. They include Hodgkin's disease, endocarditis, many of the accounts of syphilis of different parts of the body, nephritis, arterial hypertension, rheumatism, yellow fever, the pathogenesis of arteriosclerosis, coagulation of the blood, and the metabolism of calcium. There are two accounts now rather widely separated of congenital syphilis which perhaps could be combined in one place with advantage, and a like statement applies to two others of endocarditis. Among those sections which are apparently presented for the first time are kala-azar, pellagra, massive collapse of the lungs, dengue fever, sickle-cell anemia, and excellent brief statements regarding allergy and anaphylaxis. The descriptions of disease are heavily histologic. One looks in vain for some mention of tularemia, blastomycosis and sporotricosis, but there are good descriptions of yaws and some other tropical or subtropical diseases.

Among the many new illustrations, those of gross disease are bound to prove useful. The publisher has improved the general appearance of the work. It is smaller in spite of a few more pages and the unchanged printed space per page. The paper is better and there are many evidences of care. From the copy submitted for review, pages 1009 to 1024, inclusive, are missing and in their place pages 993 to 1008, inclusive, are duplicated. Some of the references at the ends of chapters and other subdivisions in previous editions are deleted and among these are some to articles by the author. The changes in these references probably are the best index of the seriousness with which this revision was carried out. There are often new references when the preceding text is unaltered. This effort to serve more seriously minded students deserves especial praise. The alphabetical arrangement of the references is also serviceable. A few textbooks of medicine in English have been widely used for many years. The demand for them has not always accompanied their first appearance. More commonly it has been an outcome of the study and experience by the author in a steady betterment of new and sometimes frequent editions. Professor MacCallum is evidently engaged in such an undertaking and has the task well in hand.

L'EXPLORATION RADIOLOGIQUE EN GYNÉCOLOGIE, TECHNIQUE, RESULTATS. Par Claude Béclère, interne des Hôpitaux de Paris. Paper. Price, 45 francs. Pp. 175, with 61 illustrations. Paris: Masson & Cie, 1928.

This work is divided into three main chapters: the first is devoted to pneumoperitoneum, stating its development, benefits and dangers; the second is given over to tubal insufflation as practiced in the United States, and the third deals with the injection of opaque substances. The history, development, methods and technic are taken up in the most minute detail. Particularly stressed is the importance of taking both the anterior and the lateral views. In the third chapter are excellent roentgenographic studies of the normal uterus and tubes. There are photographs or plates showing the outlines of the normal uterine cavity, which are followed by plates of pathologic conditions such as acute anteflexion, retroversion, infantile uterus, bicornate uterus and double uterus. This is followed by a study of the physiology of the normal and abnormal tubes as is evidenced by the roentgenogram following the injection of opaque substances. Then there is a complete study of pelvic tumors according to this method, and the illustrations here are splendid. Finally there is a study of the cause of metrorrhagia as is evidenced by irregularities of the uterine cavity. The last part of the book is a summary of the subject treated, which is then followed by a complete bibliography of the work done in the field. In general this is the most complete treatise on the subject of roentgen diagnosis in gynecology. The illustrations are excellent, the technic minutely described, and the indications and contraindications well handled.

ACUTE INFECTIOUS DISEASES. By Jay Frank Schamberg, A.B., M.D., Professor of Dermatology and Syphilology in the Graduate School of Medicine, University of Pennsylvania, and John A. Kolmer, M.Sc., M.D., Dr.P.H., Professor of Pathology and Bacteriology in the Graduate School of Medicine of the University of Pennsylvania. Second edition. Cloth. Price, $10 net. Pp. 888, with 188 illustrations. Philadelphia: Lea & Febiger, 1928.

The infectious diseases included in this book are vaccinia, smallpox, chickenpox, scarlet fever, measles, rubella, fourth disease, erythema infectiosum, typhus fever, diphtheria, Vincent's angina, mumps, whooping cough, erysipelas and cerebrospinal meningitis. The title, consequently, is not definite enough. Typhoid, epidemic poliomyelitis, influenza, pneumonia, tularemia and Rocky Mountain spotted fever are also acute infectious diseases. Why the line is drawn as it is, does not appear. The major part of the book deals with vaccinia and smallpox, scarlet fever, measles and diphtheria. Vaccination is considered at great length. There is a good chapter on serum disease. The book contains a vast amount of reliable information well arranged and clearly stated, but the style in general is verbose. One error may be corrected: Howard T. Ricketts, whose name is preserved in "rickettsia," did not die of Rocky Mountain spotted fever (page 581) but of typhus fever which he was studying in Mexico City.

LEHRBUCH DER PHYSIOLOGISCHEN UND PATHOLOGISCHEN CHEMIE IN 75 VORLESUNGEN FÜR STUDIERENDE, ÄRZTE, BIOLOGEN UND CHEMIKER. Zugleich 11. völlig neubearbeitete und erweiterte Auflage der „Probleme der physiologischen und pathologischen Chemie." Band II: Stoffwechsellehre. Lieferung 6: Fettstoffwechsel und allgemeiner Stoffwechsel. Von Prof. Dr. Otto Fürth, Vorstand der Abteilung für physiologische Chemie in Physiologischen Institute der Wiener Universität. Paper. Price, 15 marks. Pp. 335-615. Leipzig. F. C. W. Vogel, 1928.

This volume consists of twelve lectures on fat and general metabolism. The first three lectures provide a good discussion of fat digestion, absorption and body fat formation. Then follow two lectures on the biologic oxidation of fats together with various pathologic aspects. The sixth lecture is devoted to a clear and yet not too elementary discussion of body needs from the point of view of energy, nitrogen equilibrium and digestibility. Following these chapters the author gives a more detailed treatment of metabolism in starvation and in the experimental parenteral introduction of the various types of foodstuffs. Attention is called to the extremely complex factors involved in a truly balanced dietary. The lecture of vitamins and avitaminosis presents the modern point of view with due emphasis on the need of much additional and most painstaking research. The respiration calorimeter methods and results are given with brief but good discussion on the isodynamic and specific dynamic values of foods. Two excellent lectures on oxidizing enzymes and catalases are followed by one on blood gases, blood gas exchange and "Alpinismus." These are treated in an accurate historical manner but are not quite so complete in the recent development as one might expect. The last lecture is a modern treatment of fever from the biochemical point of view. The material presented in the book is well organized and presented in an entertaining yet critical and broad point of view. It is well indexed, and numerous footnotes and references are given with each lecture.

THE SOUL OF THE HOSPITAL. By Rev. Edward F. Garesché, S.J., M.A., LL.B. Cloth. Price, $1.50 net. Pp. 207. Philadelphia. W. B. Saunders Company, 1928.

The author enumerates in readable style the elements that make for a wholesome atmosphere of service in any hospital. In a number of short chapters the nurse, the physician, the public, and all other parties concerned with hospital service are reminded of their duty from the point of view of the patient's best interests. The book is rather well named. Any person connected with a hospital should profit by reading it.

Books Received

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for more extensive review in the interests of our readers and as space permits. Books listed in this department are not available for lending. Any information concerning them will be supplied on request.

THE INFANT AND YOUNG CHILD: ITS CARE AND FEEDING FROM BIRTH UNTIL SCHOOL AGE. A Manual for Mothers. By John Lovett Morse, A.M., M.D., Consulting Physician at the Floating, the Children's, the Infants' and the Beth Israel Hospitals, Boston; Edwin T. Wyman, M.D., Instructor in Pediatrics, Harvard Medical School, and Lewis Webb Hill, M.D., Instructor in Pediatrics, Harvard Medical School. Second edition. Cloth. Price, $2 net. Pp. 299, with 16 illustrations. Philadelphia: W. B. Saunders Company, 1929.

New edition of a common-sense guide for inquiring mothers.

AN INTRODUCTION TO THE HISTORY OF MEDICINE: With Medical Chronology, Suggestions for Study and Bibliographic Data. By Fielding H. Garrison, A.B., M.D., Lieutenant-Colonel, Medical Corps, U. S. Army. Fourth edition. Cloth. Price, $12. Pp. 996, with illustrations. Philadelphia: W. B. Saunders Company, 1929.

Most recent edition of the best and most complete one volume history of medicine.

HANDBOOK OF MICROSCOPICAL TECHNIQUE. For Workers in Both Animal and Plant Tissues. Edited by C. E. McClung, Ph.D., Professor of Zoology and Director, Zoological Laboratory, University of Pennsylvania. Leather. Price, $8 net. Pp. 495, with 43 illustrations. New York: Paul B. Hoeber, Inc., 1929.

Exceedingly detailed guide to the intricacies of bacteriologic technic.

THE OPERATING ROOM: INSTRUCTIONS FOR NURSES AND ASSISTANTS. By Members of the Staff of St. Mary's Hospital, Rochester, Minnesota. Second edition. Cloth. Price, $2.25 net. Pp. 235, with 239 illustrations. Philadelphia: W. B. Saunders Company, 1928.

The routine of operations in the Mayo Clinic analyzed and expounded.

THE CHILD IN AMERICA: BEHAVIOR PROBLEMS AND PROGRAMS. By William I. Thomas and Dorothy Swaine Thomas. Cloth. Price, $5, text edition. Pp. 583, with 1 illustration. New York: Alfred A. Knopf, 1928.

Fine study of modern points of view of behavior and of those responsible.

LE CANCER PRIMITIF DU POUMON: Étude anatomo-clinique. Par René Huguenin, préparateur du laboratoire d'anatomie pathologique de la Faculté. Préface du Pr G. Roussy. Paper. Price, 50 francs. Pp. 330, with 56 illustrations. Paris: Masson & Cie, 1928.

French monograph on primary cancer of the lung.

ENZYME ACTIONS AND PROPERTIES. By Ernst Waldschmidt-Leitz. Translated and extended by Robert P. Walton. Cloth. Price, $4. Pp. 235, with 12 illustrations. New York: John Wiley & Sons, Inc., 1929.

Highly technical study of enzyme actions.

THE SPECTACLES OF MR. CAGLIOSTRO. By Harry Stephen Keeler. Cloth. Price, $2. Pp. 384. New York: E. P. Dutton & Company, Inc., 1929.

Highly involved detective story with many animadversions on mental tests.

WILLIAM HARVEY. By Archibald Malloch, M.D., M.R.C.P., Librarian, N. Y. Academy of Medicine. Cloth. Price, $1.50 net. Pp. 103, with 13 illustrations. New York: Paul B. Hoeber, Inc., 1929.

Beautifully presented account of the life and work of the discoverer of the circulation of the blood.

PHYSICIAN AND PATIENT: PERSONAL CARE. Edited by L. Eugene Emerson. Cloth. Price, $2.50. Pp. 244. Cambridge: Harvard University Press, 1929.

A handbook for the public on the human side of medical practice.

HANDICRAFTS FOR THE HANDICAPPED. By Herbert J. Hall, M.D., and Metrice M. C. Buck Knox. Second edition. Cloth. Price, $2.50. Pp. 181, with illustrations. New York: Dodd, Mead & Company, 1928.

A good guide to intricacies of occupational therapy.

CHILDREN'S BEHAVIOR AND TEACHERS' ATTITUDES. By E. K. Wickman. Cloth. Price, $2. Pp. 247. New York: Commonwealth Fund Division of Publications, 1928.

Why teachers behave like human beings!

LES ABCÈS DU POUMON. Par Michel Léon-Kindberg, médecin des Hôpitaux de Paris. Paper. Price, 14 francs. Pp. 134, with 21 illustrations. Paris: Masson & Cie, 1928.

French monograph on lung abscess.

MOTHERHOOD IN BONDAGE. By Margaret Sanger. Cloth. Price, $3. Pp. 446, with 1 illustration. New York: Brentano's, 1928.

Letters of women who have revolted against too much or too rapid parturition.

HANDBUCH DER PATHOGENEN MIKROORGANISMEN. Herausgegeben von W. Kolle, R. Kraus, und P. Uhlenhuth. Lieferung 26, Band IX. Die Tierpocken. Von Dr. St. Zurukzoglu. Influenza der Pferde (Pferdestaupe). Von Prof. Dr. W. Zwick. Die Brustseuche des Pferdes. Von Prof. Dr. W. Zwick. Die Blutfleckenkrankheit des Pferdes, Morbus maculosus equorum. Von Prof. Dr. W. Zwick. Leukämie der Säugetiere und des Geflügels. Von Prof. Dr. P. Knuth. Bläschenausschlag bei Pferd und Rind. Von Prof. Dr. W. Zwick. Die praktisch witchtigen Spontaninfektionen der Versuchstiere. Von Dr. F. Gerlach. Infektionskrankheiten der Pflanzen. Von Prof. Dr. H. Klebahn. Third edition. Paper. Price, 24 marks. Pp. 357-564, with 72 illustrations. Jena: Gustav Fischer, 1928.

HANDBUCH DER MIKROSKOPISCHEN ANATOMIE DES MENSCHEN. Herausgegeben von Wilhelm v. Möllendorff. Band IV: Nervensystem. Teil 1: Nervengewebe. Das peripherische Nervensystem. Das Zentralnervensystem. Bearbeitet von M. Bielschowsky, S. T. Bok, R. Greving, A. Jakob, usw., usw. Paper. Price, 190 marks. Pp. 1093, with 880 illustrations. Berlin: Julius Springer, 1928.

A HANDBOOK OF CLINICAL CHEMICAL PATHOLOGY. By Frank Scott Fowweather, M.D., M.Sc., D.P.H., Lecturer in Chemical Pathology, University of Leeds. With foreword by Sir Berkeley Moynihan, Bt., K.C.M.G., C.B., President of the Royal College of Surgeons of England. Cloth. Price, $3 net. Pp. 216, with 18 illustrations. Philadelphia: P. Blakiston's Son & Company, 1929.

PRAKTISCHE DIFFERENTIALDIAGNOSTIK FÜR ÄRZTE UND STUDIERENDE. Herausgegeben von Professor Dr. Georg Honigmann. Band 1: Innere Medizin. Teil 5: Differentialdiagnose der Erkrankungen der Leber und Galle. Von Dr. Karl Glässner, Professor an der Universität Wien. Paper. Price, 4.50 marks. Pp. 327-392. Dresden: Theodor Steinkopff, 1929.

TEETH AND JAWS ROENTGENOLOGICALLY CONSIDERED. By Herman A. Osgood, M.D., Roentgenologist to the Turnbull Hospital. Volume V, of Annals of Roentgenology: A Series of Monographic Atlases. Edited by James T. Case, M.D. Second edition. Cloth. Price, $10 net. Pp. 135, with 419 illustrations. New York: Paul B. Hoeber, Inc., 1929.

NOMENCLATURE OF DISEASES AND OPERATIONS AND MANUAL OF THE MEDICAL RECORD. By T. R. Ponton, B.A., M.D. Nomenclature endorsed by the American College of Surgeons and the American Hospital Association. Second edition. Cloth. Price, $3.50. Pp. 199, with illustrations. Chicago: Physician's Record Company, 1928.

A COMPARATIVE STUDY OF WORLD WAR CASUALTIES FROM GAS AND OTHER WEAPONS. Prepared by Col. H. L. Gilchrist, Chief, Medical Division, Chemical Warfare Service. Cloth. Price, 35 cents. Pp. 51, with illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1928.

ÉTUDE DE LA RÉACTION DE VERNES À LA RÉSORCINE DANS LE DIAGNOSTIC ET LE PRONOSTIC DES TUBERCULOSES. Comparaison avec la réaction de fixation. Par André Breton, préparateur a l'Institut Pasteur. Paper. Price, 20 francs. Pp. 150, with illustrations. Paris: Masson & Cie, 1928.

RECENT ADVANCES IN BACTERIOLOGY AND THE STUDY OF THE INFECTIONS. By J. Henry Dible, M.B., M.R.C.P., Professor of Pathology and Bacteriology in the Welsh National Medical School. Cloth. Price, $3.50. Pp. 363, with 22 illustrations. Philadelphia: P. Blakiston's Son & Company, 1929.

THIRTY-FIFTH ANNUAL REPORT OF THE BOARD OF VISITORS OF THE CRAIG COLONY, SONYEA, N. Y., TO THE COMMISSIONER OF MENTAL HYGIENE FOR THE FISCAL YEAR ENDING JUNE 30, 1928. State of New York. Paper. Pp. 46. Sonyea: Craig Colony Press, 1928.

MEMORIA DE LA SECRETARIA DE SALUBRIDAD PUBLICA Y PROTECCION SOCIAL. Correspondiente al año 1927. Presentada al Congreso Constitucional. Por Solon Nuñez, Secretario de Estado en el Despacho de esa Cartera. Paper. Pp. 180. San Jose, Costa Rica, 1928.

MEDICAL USES OF RADIUM. Summary of Reports from Research Centres for 1927. Medical Research Council, Special Report Series, No. 126. Paper. Price, 1s. net. Pp. 22, with 5 illustrations. London: His Majesty's Stationery Office, 1928.

PLAY DAY—THE SPIRIT OF SPORT. By Ethel Perrin, and Grace Turner, Staff Associates, American Child Health Association. Paper. Price, 35 cents. Pp. 77, with illustrations. New York: American Child Health Association, 1929.

INDUSTRIAL CARBON. By C. L. Mantell, Ph.D., Metallurgical Engineers, American Institute of Chemical Engineers. Cloth. Price, $4.50. Pp. 410, with 89 illustrations. New York: D. Van Nostrand Company, Inc., 1928.

THE NOTIFIABLE DISEASES: PREVALENCE DURING 1927 IN CITIES OF OVER 100,000. Supplement No. 70 to the Public Health Reports. Paper. Pp. 33. Washington, D. C.: Supt. of Doc., Government Printing Office, 1928.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY FOR THE YEAR 1928. Volume LIII. Edited by Floyd E. Keene, M.D. Cloth. Pp. 268, with illustrations. St. Louis: C. V. Mosby Company, 1929.

TRANSACTIONS OF THE AMERICAN OTOLOGICAL SOCIETY, INC. Sixty-First Annual Meeting, 1928. Volume XVIII. Part 1. Cloth. Pp. 294, with illustrations. New Bedford: The Society, 1928.

REPORT OF THE REGISTRAR GENERAL FOR THE FISCAL YEAR ENDED JUNE 30, 1928. Board of Health of the Territory of Hawaii, Bureau of Vital Statistics. Paper. Pp. 117. Honolulu, 1928.

STUDIER OVER EKSPERIMENTEL RAKIT OG SPASMOFILI. Av. L. Stoltenberg, fhv. assistent ved institutet. Paper. Pp. 164, with 29 illustrations. Bergen: J. W. Eides Boktrykkeri A/S, 1928.

LIBRO DE ORO DEDICADO AL DR. EDMUNDO ESCOMEL A INICIATIVA DEL ATENEO DE LA JUVENTUD DE AREQUIPA, 1927. Paper. Pp. 302, with illustrations. Lima, 1927.

THE MEDICAL AND SCIENTIFIC ARCHIVES OF THE ADELAIDE HOSPITAL. No. 7 (for the year 1927). Paper. Pp. 104, with 4 illustrations. Adelaide: Government, 1928.

REPORT OF THE MEDICAL AND HEALTH DEPARTMENT OF WESTERN AUSTRALIA FOR THE YEAR 1927. No. 24. Paper. Pp. 22. Perth: Government, 1928.

Miscellany

RUSSIAN TRANSLITERATION

Because of the difficulties in the transliteration of Russian names and terms from the Russian language into the English language, the editors of the *Quarterly Cumulative Index*

Russian	English	Russian	English
А а	a	Р р	r
Б б	b	С с	s
В в	v	Т т	t
Г г	g (occasionally h)	У у	u
Д д	d	Ф ф	f
Е е	e	Х х	kh (h or ch)
Ж ж	j	Ц ц	ts (or tz)
З з	z	Ч ч	ch (or tch)
И и (before a consonant)	i	Ш ш	sh
І і (before a vowel)	i	Щ щ	sheh
К к	k	Ъ	y
Л л	l	Э э	e
М м	m	Ю ю	yu
Н н	n	Я я	ya
О о	o	Ѳ ѳ	th
П п	p	Ѣ	Y

Standard for transliterating from the Russian.

Medicus have adopted the forms shown in the accompanying list as a standard for transliteration. It is hoped that all scientific writers in the field of medicine in making such transliteration will follow these forms in the interest of uniformity.

THE CARBON ARC VERSUS SUNLIGHT

Letter circular LC-225 of March 5, 1927, summarized "Some Outstanding Accomplishments of the Bureau of Standards in 1926," including a summary of a research on the radiation emitted by the carbon arc lamp, in which it is stated that, "of all the artificial illuminants tested, the carbon arc is the nearest approach to sunlight in spectral energy distribution." Unfortunately this whole caption is being used in the advertising literature with the inevitable result of an increased demand for this letter circular, which is now out of print. It has therefore been found desirable to publish a further statement on this subject, which is given in technical news bulletin 140 of the Bureau of Standards, Department of Commerce, December, 1928.

First of all, it is to be emphasized that no artificial source of radiation has yet been found which has a spectral energy distribution exactly like that of sunlight. Of all the sources examined, the spectral energy of the carbon arc is the closest approach to sunlight; but even this is not an exact match of sunlight in spectral intensity. It contains ultraviolet radiation of very short wavelengths and infra-red radiation of long wavelengths, which are not found in sunlight. Moreover, it emits an intense violet radiation (the "cyanogen band") which is in excess of that observed in sunlight. By covering the carbon arc with a screen of special glass it is possible to shut out the ultraviolet rays of short wavelengths and the infra-red rays of long wavelengths, which are not present in sunlight; but the intense violet "cyanogen band" will remain until an amethyst-colored screen can be devised which will partly absorb this band.

Whether it is necessary to use artificial radiation having exactly the same spectral energy distribution as sunlight for therapeutic purposes remains to be determined, and is not a question for the bureau to decide. It is, however, relevant to add that the radiation emitted by the carbon arc depends on the electric current and the kind of electrodes used (white flame, blue flame, yellow flame, red flame), and that it depends but little on the kind of mounting of different manufacturers. Comparative data on the carbon and the mercury arc lamps (the former under different conditions of current, etc.) are given in scientific paper 539, obtainable only from the Superintendent of Documents, Government Printing Office, Washington, D. C., price, 15 cents prepaid.

THE "PRAYER OF MAIMONIDES" AND ITS TRUE AUTHOR

A recent endeavor to find the Hebrew or Arabic original of the beautiful prayer for guidance and support in the honorable work of the physician, published and republished as the work of Moses ben Maimon, the physician of Saladin and the greatest light in Jewish Medieval philosophy, has led to the rediscovery of a letter written by the late Dr. G. Deutsch in the *American Israelite* of Cincinnati, March 19, 1908, which authoritatively settles the question of authorship and date of the prayer in question. Dr. Deutsch (who was a theologian and historian, not a physician) wrote substantially as follows:

> The Prayer of Maimonides, so called, was written neither by Maimonides nor by any other medieval physician. It is the work in good faith, of a modern Jewish doctor, Marcus Hertz of Berlin (1747-1803), the friend and physician of Moses Mendelssohn. It was written in German and was translated into Hebrew by Isaac Euchel, who published it in the Hebrew periodical *Ha-Measef*, vol. VI, pp. 242-244, 1790.
>
> The source of the error seems to be Philippson, who published the prayer in his "Weltbewegende Fragen," Leipzig, 1869, vol. II, pp. 159-160, although he did not say that it was the prayer of Maimonides but ascribed it to a Jewish physician of the twelfth century. From there it has traveled through any number of medical journals (very likely through the medium of the *Magazin für die Literatur des Auslands*, published by a Jew, Joseph Lehmann) and was finally embodied in Haeser's "Geschichte der Medizin," vol. I, p. 837, Jena, 1875, which is a standard book. From there Julius Pagel, professor of the history of medicine in Berlin University, took it and published it again in the *Allgemeine Zeitung des Judenthums*, 1892, pp. 294-295. (Pagel states, however, that the source is uncertain.) Then it disappears for some time, until in 1902 it was again taken up by the *Medizinische Wochenschrift*, 1902, number 32, and from there copied in *Korrespondenzblatt für Schweizerische Aerzte*, 1902, number 19. From there Rabbi Jules Wolff of Chaux de Fonds translated it into French and published it in "Univers Israelite," Feb. 27, 1903, adding that it was by Maimonides, and, in spite of the fact that the real source of the prayer was indicated by Moise Schwab in the same periodical, March 20, 1903, Maimonides is still being honored with the authorship of this prayer, which Professor Pagel, with unconscious humor, admires for its modern spirit.

Reference may also be made to a paper by Dr. Harry Friedenwald, "The Ethics of the Practice of Medicine from the Jewish Point of View" (*Bull. Johns Hopkins Hosp.* **28**:260 [Aug.] 1917).

Medicolegal

Drug Addiction and Insanity

(Franks v. State (Texas), 5 S. W. (2d) 157)

The appellant was convicted of the murder of his wife and appealed to the court of criminal appeals of Texas. The only defense was that of insanity. Practically all witnesses testified that for many years the appellant had been a drug addict. Four judgments of lunacy against him, on record in the county court, were introduced by the defense. Two of these judgments, said the appellate court, must pass out of consideration, because they were rendered by lunacy commissions, each composed of a group of physicians. The judgment of such commissions became invalid because of a decision of the supreme court of the state holding unconstitutional the law authorizing the trial of one accused of lunacy, by a commission of physicians. Two judgments of lunacy, however, remained unvacated at the time of the trial. The fact that one such judgment bore a memorandum showing that the appellant was released on the recommendation of a physician was not regarded by the appellate court as sufficient evidence that the judgment had been vacated or annulled. Over the objection of the defendant, the trial judge permitted the state to show that it was the custom of the county court to enter judgments against drug addicts who needed treatment, for the purpose of confining them so that they might be treated for their addiction. But, said the appellate court, the solemn judgment of a court cannot be impeached or attacked or in any wise vacated or annulled by proof of such a custom. Testimony of such a custom was not admissible for the purpose of relieving the state from the burden of proof on the issue of insanity in the case of one who interposes that defense and who is shown to have been adjudged insane prior to the commission of the alleged offense. In the present case the trial court charged the jury that, where insanity is interposed as a defense, the burden of proving such defense rests on the accused. The charge was manifestly erroneous. The court should have responded to the request of the defendant and instructed the jury that the burden was on the state to show the sanity of the accused beyond all reasonable doubt, in view of the fact that he had been adjudged insane at a prior time. The judgment of the trial court was reversed and the cause remanded.

Adjustment of Fees to Patient's Wealth

(Anderson et al. v. Caulk (Texas), 5. S. W. (2d) 816)

The appellee, Caulk, sued Anderson and others, as trustees and executors of the estate of George W. Breckenridge, to recover money due for medical and surgical services rendered. Judgment was rendered in his favor, and the trustees and executors appealed to the civil court of appeals of Texas (El Paso). In the trial court, the plaintiff claimed $15,000, less $5,000 paid by the patient during his lifetime. The defendants alleged that the payment of $5,000 was made by the patient in full settlement of the plaintiff's claim, and that if it was not accepted by the plaintiff in full settlement, it had nevertheless been held by him, knowing that the patient so intended it. The defendants alleged further that the plaintiff's services were worth not more than $1,000 and claimed that if the money paid by the patient was not treated as a settlement, the defendants had the right to recover from the plaintiff so much of the $5,000 paid by the patient as exceeded the value of plaintiff's services with interest on that balance.

The plaintiff claimed that when his services were rendered his patient was a prominent and wealthly man and well able to pay for such services, and that both parties understood and contemplated that the patient would pay a full, adequate and reasonable fee. He contended that a charge of $15,000 was a reasonable, compensatory charge. The plaintiff claimed further that, so far as a custom has been or can be established, the charge was the prevailing custom in the city of St. Louis where the operation was performed, and throughout the larger cities of the United States, for such services and on a person as prominent and as able to pay as was his patient, and of his age, physical condition and circumstances. The patient, it was represented, was a very prominent and wealthy man and had no family or other persons legally dependent on him for support. The defendants claimed, however, that neither the wealth of the patient, nor his obligations to persons dependent on him, nor the custom alleged, should be considered in fixing medical and surgical fees, and that there was no allegation that the patient expressly agreed to pay the fee charged or to pay in accordance with the alleged prevailing custom. The trial court was requested to instruct the jury not to consider the wealth of the patient in determining the reasonableness of compensation. The trial court refused to give these instructions. The jury returned a verdict of $10,000 in favor of the plaintiff. The defendants thereupon appealed.

The appellee (the plaintiff in the court below) alleged and in the opinion of the appellate court sufficiently proved, a custom among physicians to charge patients for professional services rendered, in keeping with the prominence and financial worth and ability of their patients to pay. The appellants insisted that there was no evidence to show that the patient in this case knew of the alleged custom. A custom, said the appellate court, to constitute a fixed element of a contract, must be known to both parties. Unless both parties knew of the custom, the custom alleged can form no part of the implied understanding or agreement, and all evidence as to such a custom should be excluded. In the present case, it was neither alleged nor shown that the alleged custom was so general or universal that the patient was chargeable with a knowledge of it. The law does not imply a knowledge of such a custom. In the present case the appellate court was unable to find evidence in the record bringing a knowledge of such a custom home to the patient.

The plaintiff testified that his charge for the services rendered would have been around $500 to $1,000 if his patient had been a person of moderate means. On an implied agreement, the law allows a reasonable compensation. The question whether in a suit on an implied agreement the prominence and wealth of the patient are elements to be considered in estimating what is a reasonable compensation was before the Texas courts in *Swift* v. *Kelly*, 63 Texas Civ. App. 270, 133 S. W. 901. In that case the appellate court held that the trial court erred in permitting the plaintiff to show the reasonable value of his services by proving that the defendant was wealthy and proving a custom among physicians to graduate their charges according to the financial condition of the patient. This rule, said the court in the present instance, is sound. If physicians and surgeons, by a custom among themselves, determine the reasonable value of their services on the basis of the financial conditions of their patients, the merchant, mechanic, and all other combinations of service, including that of ordinary labor, can fix the value of their service in the same way. The trial court very properly did not instruct the jury that it could consider the prominence and wealth of the patient as elements to be considered in estimating the reasonable compensation to be awarded, but the wealth of the patient was made an element to be considered, both by the pleading and in the evidence, and it was considered by the jury. This, the appellate court held, was error.

The appellants assigned as a further error the admission by the trial court of the testimony of the plaintiff, the attending physician, as to his professional services. In support of their contention, the appellants invoked the statute providing that neither party shall be allowed to testify against the other as to any "transaction" with or statement by the testator, intestate, or ward, unless called to testify by the opposite party, the provisions of which statute extend to and include all actions by and against the heirs or legal representatives of a decedent arising out of any transaction with him. In the present case the plaintiff was not called to testify by the opposite party and he did not testify as to any statement by the testator. The issue turned on the answer to the inquiry whether the matters about which the witness testified involved a "transaction" with the deceased. The court concluded that an operation performed by a physician or surgeon is a transaction within the meaning of the statute and that the plaintiff, suing the trustees of the estate of the decedent for his compensation for services rendered to the decedent, was not a competent witness to testify to what he saw or did in the performance of the operation or treatment.

For reasons stated, the case was reversed and remanded.

Liability of Food Vendor

(Horn & Hardart Baking Co. v. Lieber (U. S.), 25 F. (2d) 449)

The appellant maintained a public restaurant. The respondent, while eating strawberries in that restaurant, bit down on a nail or tack such as is used in making berry boxes, and wounded her gum. In the district court, the case was tried by the judge, without a jury, and a judgment was rendered for the plaintiff. The defendant appealed to the United States Circuit Court of Appeals, Third Circuit. On behalf of the injured party, it was contended that either the proprietor of the restaurant was the absolute insurer of the fitness of all foods served or that the mishap was itself proof of negligence. The court, however, citing authorities, held that an innkeeper is not the insurer of food, but that his duty is that of exercising due care in the furnishing and serving of it. Discussing the theory of the injured person that the injury itself was proof of negligence, the court pointed out that foods are assembled from distant places and pass through different ownerships and handlings, all of which may contribute to the food not being absolutely pure or safe. The fact that the plaintiff got this tack in her jaw when eating strawberries would not in and of itself be evidence of negligence on the part of the defendant. Uncontradicted proofs were that the berries were bought from a dealer of the highest repute, that they were washed, individually hulled, patted in a towel, and placed in individual dishes for serving. The testimony of an expert in such matters was that this was "the proper and most suitable way available," and "the standard method." It is possible that in the course of the shipment and delivery of the berries the tack may have been jolted about and finally become embedded sidewise in a berry and been quite hidden from view. To hold the defendant guilty of negligence would be to base a verdict on speculation instead of on the solid basis of proved negligence. The judgment of the court below was reversed.

Overexertion and External Violence Distinguished

(Lyon v. Travelers' Protective Ass'n. of America (U. S. C. C. A. N. Car.), 25 F. (2d) 596)

The appellant, Lyon, instituted this suit as beneficiary under an accident insurance contract on the life of her husband. The deceased accidentally drove his automobile off the road. He attempted to drive back into the road, but to handle the car under such circumstances required great exertion. As a result, the insured ruptured a blood vessel, which resulted in his death shortly thereafter. The insurance contract on which the plaintiff relied provided payment in case of death, when it was caused by external violent and accidental means, independently of all other causes, but that the insurer should not be liable for injury causing death, resulting from voluntary overexertion. At the conclusion of the testimony, the trial judge entered judgment dismissing the action. The plaintiff thereupon appealed to the U. S. circuit court of appeals, fourth circuit, which held that the dismissal of the case was proper. The fatal rupture of the blood vessel was not caused by any external thing, such as a blow or a fall. It occurred while the deceased was engaged in violent exertion. Both the accidental and the external elements were lacking from the means that produced death. Death was not caused by the fact that the deceased accidentally got off the road, but by the fact that he overexerted himself in trying to get back into the road. It resulted, not from a blow or other cause from without, but from overexertion from within.

Unlawful Lunacy Commitment

(Clark v. Matthews et al. (Texas), 5 S. W. (2d) 221)

The appellant, it was alleged, was illegally restrained of his liberty by the sheriff of Uvalde County and the superintendent of the San Antonio State Hospital. Application was made to the district court for a writ of habeas corpus, but after hearing the evidence the district judge held that the appellant was lawfully restrained. An appeal was taken to the court of civil appeals of Texas. Section 9 of chapter 174 of the laws of 1925 provides that no person shall be committed to any institution for the insane or other mentally ill persons unless there has been filed with the county judge a certificate of the insanity of such person by two properly qualified and licensed physicians, nor without an order therefor, signed by the county judge, stating he finds that the person committed is insane. The language might lead to the conclusion that the commitment could be made without affording the supposedly insane person an opportunity to submit evidence on his own behalf. Section 10 of the act cited, however, makes provision for a trial by jury, if demanded. This statute was not complied with. The appellant was taken into custody by virtue of a complaint filed by the sheriff and was adjudged to be a lunatic. He demanded that he be permitted to obtain the service of an attorney, but the right was denied him and while he was incarcerated in the jail he was tried as to his mental state and he was sent to a hospital for insane persons at San Antonio. The unfortunate person complained against, or his friends, have the right to insist on compliance with every form prescribed by law, which has been enacted for the protection and preservation of liberty. Those forms were not complied with in this instance. The judgment of the court below was reversed and it was ordered that the appellant be discharged from his unlawful restraint.

Intoxicating Liquor Defined

(Ver Wilst v. State (Indiana), 161 N. E. 249)

The appellant was convicted of the unlawful possession of intoxicating liquor and appealed to the supreme court of Indiana. He contended that the act concerning intoxicating liquor was unconstitutional and void because "it assumes to definitely define and fix a standard, wholly at variance with known facts as to when liquor is intoxicating and when it is not, to wit, that one half of 1 per cent of alcohol by volume constitutes the liquor intoxicating." It is a well settled rule, said the court, that the legislative department may establish a standard for determining whether liquor is within the operation of the act, by defining the term "intoxicating liquor," and may thereby fix the percentage of the allowed alcoholic content below that which is in fact intoxicating. It may thus include within the operation of the law beverages that are similar to intoxicating liquor but which are in themselves innocuous, if by doing so it makes the enforcement of the law easier and evasion more difficult. The method of defining certain classes of liquors as intoxicating and then prohibiting them as intoxicating liquors, instead of prohibiting them directly in the first instance, may be open to the criticism that it is not logical, but it was used in the National Prohibition Act and has been used in the prohibition acts of various states for many years. It has been uniformly upheld. The courts have held that the words of such a statute do not purport to change the nature of things and make liquors intoxicating which are not intoxicating; but that by this method it is only enacted that the words "intoxicating liquor," where used in the act, shall be deemed to include any liquor containing more than the specified amount of alcohol.

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Mobile, April 16-19. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.

American Association for the Study of Goiter, Dayton, Ohio, March 25-27. Dr. K. W. Kinard, Bryant Building, Kansas City, Mo., Secretary.

American Association for Thoracic Surgery, St. Louis, April 25-27. Dr. Ethan Flagg Butler, Robert Packer Hospital, Sayre, Pa., Secretary.

American Association of Anatomists, Rochester, New York, March 28-30. Dr. Lewis H. Weed, Johns Hopkins Medical School, Baltimore, Sec'y.

American Association of Pathologists and Bacteriologists, Chicago, March 28-29. Dr. H. T. Karsner, 2109 Adelbert Road, Cleveland, Secretary.

American College of Physicians, Boston, April 8-12. Mr. E. R. Loveland, 133 South 36th Street, Philadelphia, Secretary.

American Society for Clinical Investigation, Atlantic City, April 29. Dr. J. T. Wearn, Boston City Hospital, Boston, Secretary.

American Surgical Association, Cleveland, May 2-4. Dr. Lincoln Davis, 203 Beacon Street, Boston, Secretary.

American Therapeutic Society, Pittsburgh, April 5-6. Dr. W. J. Mallory, 1720 Connecticut Avenue, N. W., Washington, D. C., Secretary.

District of Columbia, Medical Society of, Washington, D. C., May 1. Dr. C. B. Conklin, 1718 M Street, N. W., Washington, D. C., Sec'y.

Louisiana State Medical Society, New Orleans, April 9-11. Dr. P. T. Talbot, 1551 Canal Street, New Orleans, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, April 23-25. Dr. John T. King, Jr., 1211 Cathedral Street, Baltimore, Secretary.

North Carolina, Medical Society of the State of, Greensboro, April 22-24. Dr. L. B. McBrayer, Southern Pines, Secretary.

Tennessee State Medical Association, Jackson, April 9-11. Dr. H. H. Shoulders, Lamburth Building, Nashville, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American J. Obstetrics and Gynecology, St. Louis

17: 1-150 (Jan.) 1929

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*Changes in Leukocytes During Labor and Puerperium. J. Jarcho, New York.—p. 13.
*Dry Labor: Analysis of 600 Cases. M. Schulze, San Francisco.—p. 20.
*Pathology of Consecutive Miscarriages in Private Obstetric Practice: 104 Cases. J. L. Huntington, Boston.—p. 32.
*Decidual Reaction in Extra-Uterine Pregnancy. B. S. Kline, Cleveland. —p. 42.
Impetigo or Pyodermatitis Neonatorum. C. B. Reed, Chicago.—p. 49.
*Case of Placenta Accreta: Treatment: Sequelae. R. A. Wilson, New York.—p. 58.
Treatment of Uterine Injuries: Seven Cases. L. S. Schwartz, New York.—p. 66.
Ectopic Gestation: Seventy-Six Cases. J. L. Bubis, Cleveland.—p. 74.
*Fetal Mortality in Breech Presentations: Is Prophylactic External Version Advisable? E. L. King and A. H. Gladden, Jr., New Orleans. —p. 78.
Anemia in Pregnancy. C. E. Galloway, Chicago.—p. 84.
*Some Physiologic Aspects of Eclamptic Toxemia. L. A. LeDoux, New Orleans.—p. 90.
*Traumatic Perforation of Uterus With Severance of Rectum: Case. W. W. Maxwell, Nashville, Tenn.—p. 96.
Endometriosis of Abdominal Scar Following Cesarean Section. P. H. Williams, New York.—p. 102.
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Fluctuation of Blood Sugar Before and After Eclamptic Convulsion. J. M. Laferty, J. A. Nark and J. J. Sweeny, Philadelphia.—p. 113.
*Repair of Vesicovaginal Fistula. A. E. Hertzler, Halstead, Kan.—p. 114.
Bilateral Tubal Pregnancy with Rupture of Both Tubes. H. H. Johnson and J. S. Diasio, New York.—p. 116.
Early Adenocarcinoma of Uterine Body Completely Removed by Curettage. S. Seides, New York.—p. 117.

Changes in Leukocytes During Labor and Puerperium.—Jarcho made a study of the changes in the differential leukocyte count during labor and the puerperium in fifty-five patients, twenty-three of whom were normal. During labor and the first day or two post partum, there is a moderate grade of leukocytosis, which reaches its peak several hours after delivery. The polymorphonuclear cells are increased both in relative and in absolute numbers. There is a slight percentage decrease in the small lymphocytes, which is usually inversely proportional to the percentage of neutrophils and regains the normal value at about the same time. The eosinophils and basophils are notably absent or greatly diminished during labor. In the absence of complications, the eosinophils begin to reappear by about the third day of the puerperium. The neutrophils show a marked shift to the left with the Arneth count and also in Schilling's hemogram. Except for the established fact that the percentage of polymorphonuclear cells is increased in infections, the differential count would appear to be of little value in labor and the puerperium. It has been observed that the eosinophils do not appear until several days or more after the third day in complicated cases; that the percentage of lymphocytes is usually still further diminished in the presence of fever or other complications, and that even such slight complications as a cracked nipple, a lump in the breast, or slight tenderness in the abdomen may cause a slight reduction in the percentage of lymphocytes.

Analysis of 600 Cases in Dry Labor.—The 600 cases analyzed by Schulze represent approximately 10 per cent of 6,500 cases. Predisposing factors are primiparity, overdistention of the uterus, as by large children or twins, abnormal presentations, and lack of engagement of the head. The determining factor appears to be a lack of tensile strength in the membranes probably due to a deficient development of the connective tissue layers. Many of the labors are premature, but this is probably a consequence rather than a cause. Labor begins in twenty-four hours or less in 90 per cent of cases; in those in which the delay is longer, two thirds are premature. The longest delay was nineteen days. Castor oil and quinine were successful in inducing labor in more than 90 per cent of the cases in which they were used. No fetal deaths could be attributed to the quinine. The average length of the first stage of labor was considerably shorter than that usually accepted as normal in both multiparas and primiparas. One third of the primiparas and two thirds of the multiparas had short first stages—six hours or less. The second stage was not influenced. Labors prolonged more than twenty-four hours were less frequent than in an unselected series. Dry labors which were prolonged, and also the cases of dry labor in which dystocia developed requiring serious operative interventions, showed other abnormalities, as malpresentations, contracted pelves and overlarge children, in a high percentage of cases. Fetal mortality was not higher than normal and a high percentage of the fetal deaths occurred in uncomplicated cases. There was no maternal mortality in the 600 cases. Maternal morbidity was slightly higher than that found in the 6,500 unselected cases. Cord inflammations were twice as frequent as in the 6,500 cases, but they occurred almost entirely in prolonged labors or in operative cases. In abnormal labors, as those complicated by contracted pelves or malpresentations, the fetal risk is considerably increased by premature rupture of the membranes. The maternal risk as measured by maternal morbidity is also increased slightly. Results with bag treatment were poor, and, although the series was small and the poor results were often due to other causes than the bag, little hope of reduction of either fetal mortality or maternal morbidity is offered.

Pathology of Consecutive Miscarriages.—As a result of his study of 104 cases Huntington feels that endometritis and retroversion play a minor rôle in the etiology of abortions. Defective germ plasm is the chief cause of abortion. Trauma, when sufficiently violent to rupture the amniotic sac, is an undoubted cause of abortion. Multiple fibroids may cause the death of the fetus in utero with subsequent abortion. Huntington believes that defective germ plasm may exist normally and account for an occasional abortion in perfectly healthy persons with unimpaired fertility, but that it is much more likely to occur when the patient is overnourished or undernourished or poisoned from within or without. Besides focal infection one should consider the effect here of faulty endocrine function, especially deficient thyroid secretion or defective development of the corpus luteum and anterior lobe hormones. It is also possible that focal infection, faulty endocrines, fatigue or other poisons may play a rôle in the creation of spermatozoa capable of impregnating the ovum but lacking the vitality to bring the egg to full development.

Decidual Reaction in Extra-Uterine Pregnancy.—In a study made by Kline of seventy-four cases of extra-uterine pregnancy, evidence was found for the beliefs that: a decidual reaction of greater or less extent occurs constantly at the site of implantation; the decidual tissue persists as long as the chorionic villi are intact; following the termination of the pregnancy by hemorrhage with resultant degeneration of the chorionic villi, the local decidual tissue undergoes involution; a distant decidual reaction in other portions of the tube, uterus or elsewhere is not constant and, when it does occur, it may persist after the degeneration of the chorionic villi and the complete involution of the local decidual tissue; the relatively frequent occurrence of vaginal bleeding in extra-uterine pregnancy probably depends on changes other than the casting off of uterine decidual tissue.

Placenta Accreta.—Wilson reports a case of partial placenta accreta which led to gangrene of the uterus, pelvic peritonitis, venous thrombosis and gangrene of the lower extremities.

Fetal Mortality in Breech Presentations.—King and Gladden recommend that an attempt be made to turn the baby by external manipulations between the thirty-second and thirty-sixth weeks, when the diagnosis of breech presentation is made

that early. If the version fails or if the patient is not seen until labor has begun, they feel that the best results are obtained by breech extraction under surgical anesthesia with ether. In their opinion, this is best begun in the case of a full breech when the buttocks begin to emerge from the vulva, while in frank breech and in footling cases (on account of the danger of prolapsed cord), it is well to undertake it as soon as the cervix is fully dilated. Colpeurysis by a hydrostatic bag or the ironing out of the vagina will be of great assistance, and episiotomy is wise in most primiparas. Forceps applied to the after-coming head will at times be a life-saving procedure.

Physiologic Aspects of Eclamptic Toxemia.—LeDoux is convinced that faulty hygiene, improper diet with constipation and intestinal putrefaction appear as predisposing factors in eclamptic toxemia. There are indications that eclamptic toxemia primarily results from a physiologic breakdown beginning in the liver. The detoxicating function of the liver appears to be disturbed first, followed by interference with other functions. The transition to a pathologic condition is progressive and rapid. The pyramiding of symptoms and signs results from a progressive disturbance of physiologic function, followed by the substitution of a pathologic condition finally involving all of the organs. The liver, kidneys and heart become especially affected, in the order named. Pulse acceleration and intermittent vaginal bleeding are two signs that should be added to the typical picture of eclampsia. From the seventh month until term the parturient woman is called on to take care of increasing catabolic changes. Protecting the patient, by careful prenatal care, against overburdening of her physiologic functions and attempting to equalize the diminished detoxicating liver function are logical demands for proper prophylaxis against eclampsia.

Traumatic Perforation of Uterus with Severance of Rectum.—Maxwell relates the case of a multipara, aged 30, who had had a spontaneous miscarriage of a five months' fetus ten hours previous to admission. The attending physician stated that the placenta could not be expressed. Assisted by another physician, he attempted a manual removal; this failing, pointed steel forceps were used. Before the forceps were used, a bluish cordlike structure was seen protruding from the uterus. One physician thought that it was the umbilical cord; the other, that it was intestine. It was not looped and from its ragged end exuded a brownish substance. It was removed, according to the physician. The woman was very anemic and the abdomen was markedly distended with tympany anteriorly and dulness in both flanks suggesting fluid. Abdominal tenderness was extreme. Through a bivalve speculum the placenta was seen in the cervix and easily removed without excessive bleeding. Careful examination of the placenta revealed that the umbilical cord had been cut away close up to the amnion and the membranes torn off. While preparations for a transfusion were being hurried, the patient was given a magnesium-glycerin and water enema to relieve the marked distention of the abdomen. Only a small amount of the fluid returned. The patient stated that she was sure she would feel much better as soon as the "gas" was passed. In less than ten minutes the patient began screaming with pain in the abdomen. This agony ceased in about five minutes and the patient seemed to be comfortable, only to pass gradually into unconsciousness. In a few minutes she died of paralysis of the respiration, for the heart continued to beat with regularity and good volume for several minutes after respiration ceased. Death came within thirty minutes after the enema was given. A necropsy was performed. The posterior wall of the uterus had two perforations. The continuity of the sigmoid and rectum was broken by the complete severance of the rectum and apparently the removal of a portion of it.

Repair of Vesicovaginal Fistula.—The essential feature of the operation done by Hertzler is that a fold of vaginal mucosa is so prepared that a broad surface is brought in coaptation which is protected from contamination through the bladder by means of staple sutures. The first steps in the operation do not differ from the more or less classic procedures. The vaginal wall about the fistula is elevated so that the freshened surfaces may be brought into contact and inverted into the bladder by a row of number 00 chromic catgut sutures. This row is inverted still further by a second row of similar sutures, either continuous or interrupted. The mucosa of the vagina is now elevated from the bladder for a centimeter or two, depending on the size of the opening to be closed. These flaps must be mobilized so that they can be brought together without tension. The bases of the flaps are brought together by staple sutures of silkworm gut. They must be placed at least a centimeter from the edge and brought snugly together. The line of sutures must not be so tightly drawn together as to disturb the circulation. The edges are now brought together with silkworm-gut sutures. This line must be delicately placed so as to leave sufficient tissue between this and the preceding row of sutures, for it is on the vascular integrity of this tissue that the success of the operation depends. A cross-section of the line of repair shows the first two lines of sutures inverting the bladder wall into the bladder, while the staple suture inverts the vaginal wall into the lumen of the vagina. A permanent catheter is placed and is allowed to remain a week or ten days. Care must be taken lest the lumen of the catheter become occluded. The staple sutures remain in position about three weeks.

Annals of Internal Medicine, Ann Arbor

2: 603-724 (Jan.) 1929

*Hemopoietic Effect of Nuclear Extractives in Human Anemias. N. W. Jones, B. I. Phillips, O. Larsell and H. T. Nokes, Portland, Ore.—p. 603.
*Differential Blood Count in Active Pulmonary Tuberculosis: 1,000 Cases. J. W. Flinn, Prescott, Ariz.—p. 622.
*Rheumatic Fever: Clinical Manifestations, Etiology and Treatment. D. Riesman and J. C. Small, Philadelphia.—p. 637.
Dietetic Treatment of Diabetes Mellitus: Restatement of Fundamental Principles. L. H. Newburgh, Ann Arbor, Mich.—p. 645.
Difficulties in Diagnosis of Cancer of Internal Organs. J. M. Swan, Rochester, N. Y.—p. 650.
*Symptoms of Dissecting Aneurysm of Aorta. L. T. Gager, Washington, D. C.—p. 658.
Ulcerative Endocarditis of Pulmonic Cusps: Case. E. Weiss, Philadelphia.—p. 665.
*Albuminuria and Nephritis Following Injection of Toxin-Antitoxin: Two Cases. C. D. Mercer, West Union, Iowa.—p. 667.
Complete Heart Block: Autopsy Findings: Case: Syphilitic Myocarditis and Aortitis. W. J. Wilson, Detroit.—p. 669.
Scarlet Fever. A. R. Dochez, New York.—p. 673.
Relation of Chemical Influences, Including Diet and Endocrine Disturbances, to Epilepsy. H. R. Geyelin, New York.—p. 678.
Ureteral Stricture as Cause of Attempted Suicide. M. Bernstein, Philadelphia.—p. 682.
Our Changing Profession. T. B. Cooley, Detroit.—p. 685.

Hemopoietic Effect of Nuclear Extractives in Human Anemias.—Jones et al. conclude tentatively that the hemopoietic stimulant, unknown as yet as to its composition, is an integral part of the cell nucleus, and that the effect noted on blood production from the taking of different animal tissues depends on the amount of nuclear substance contained in the particular meat eaten. Liver has shown a greater stimulative effect than pancreas and thymus, but less than that of spleen, and the greatest effect, thus far noted, has been obtained from the washed nuclei of the blood cells from the fowl. A practical point may be suggested from this observation, namely, that liver alone, which is often repugnant to persons, may be replaced by the eating of kidney, sweetbreads, spleen and possibly beefsteak. The use of expensive pharmaceutic products may therefore, in part, be avoided. The results indicate further a like response from the administration of these nuclear extractives in both primary and secondary anemias.

Differential Blood Count in Active Pulmonary Tuberculosis.—The monocyte-lymphocyte and the lymphocyte-neutrophil ratios (either of the numbers per cubic centimeter or of the percentages) seem to Flinn to give the truest conception of the status and progress of the condition. The percentages in themselves seem the next most reliable indication. The numbers per cubic centimeter, although interesting and helpful, seem to Flinn the least important of these three classes of observations. A decreasing monocyte-lymphocyte ratio and an increasing lymphocyte-neutrophil ratio point very definitely to a more active and extensive lesion. The converse points just as definitely to an improved lung condition. An increase in the percentages of neutrophils and of monocytes, with a decrease in the percentage of lymphocytes, points quite definitely to a more active and extensive lesion. The converse points quite definitely to an improved lung condition. Corresponding changes

in the counts per cubic centimeter of these cells point in corresponding directions, but less definitely.

Etiology and Treatment of Rheumatic Fever.—For about eighteen months antiserum prepared by immunizing horses with *Streptococcus cardioarthritidis* has been employed by Riesman and Small in the treatment of about 270 patients. The serum was employed first in chorea and acute rheumatic fever and later in certain forms of chronic arthritis in an effort to determine the relationship, if any, between these forms and acute rheumatic fever. The antiserum has been prepared in horses and more recently in cattle—the two appear to be equally effective in treatment. The use of the bovine serum has been followed by mild serum disease; hence it is preferable to equine serum, which frequently calls forth a rather severe serum sickness. Since November, 1927, a concentrated antiserum has been available. The amount to be injected is still empiric, as so far no method has been developed for determining the relative antibody content of the different lots of serum. Experience has shown that the antiserums now being produced are of such potency that the adequate dose ranges from 5 to 15 cc. Excessive amounts have not been followed by the definite alleviation of the joint symptoms or by that decline in temperature which had followed the use of smaller and seemingly adequate amounts. This paradoxical sequence of events following excessive doses has been attributed to focal inflammatory reactions arising at the sites of the union of antigen and antibody in such amounts as to give rise to a reaction similar to the Arthus phenomenon. In practice these focal reactions are prevented by avoiding the injection of excessive amounts of antibody and by administering the estimated adequate amounts of antibody in fractional doses, allowing from twelve to eighteen hours to elapse between the injections of the several doses. The focal reactions have not been noted by the authors in private patients who were under full doses of salicylates at the time the serum was administered. Moreover, focal reactions well established have responded to the administration of moderate doses of salicylates in from eighteen to twenty-four hours. A much more important phase of the treatment of the rheumatic diseases is concerned with the problem of active immunization. In general, passive immunity conferred by an antiserum is of short duration; active immunity conferred by vaccines or by antigenic products of bacteria is of a more lasting character. Rheumatic fever as a chronic continuing disease of the heart could scarcely be expected to respond adequately to serotherapy. The authors believe that relapses following serotherapy can be greatly reduced by the use of repeated injections of small amounts of vaccine or of the soluble products of *Streptococcus cardioarthritidis*, and that this combination constitutes an effective prophylactic therapeutic procedure in the rheumatic diseases. The soluble antigen of *Streptococcus cardioarthritidis* in dilutions of 1:10,000 and 1:1,000 is the agent at present employed in attempts at active immunization. The 1:10,000 dilution is used in initial doses of not more than 0.5 cc. and maintained at this amount until no reaction following its injection can be detected. After that the doses are gradually increased by from 25 to 50 per cent of the dose last given. The injections are administered subcutaneously and at intervals of from five to seven days. The soluble antigen should be employed as a routine in patients treated with antiserum. The injections may be started as early as the third day or may be delayed until after the period of serum disease has passed. In the subacute and chronic forms the antigen alone may be used.

Symptoms of Dissecting Aneurysm of Aorta.—Analysis by Gager of the clinical features and course shown by patients with dissecting aneurysm reveals a syndrome which in certain groups of cases can be considered characteristic. These features are: a sudden onset, usually following strain; pain, which is severe, continuous and often with significant distribution; anomalies of the circulation, and remote effects from disturbances of the blood supply in other organs or systems of the body.

Albuminuria and Nephritis Following Injection of Toxin-Antitoxin.—Of 125 children between the ages of 6 and 20 who appeared for immunization, thirteen, or 10 per cent, had albuminuria without other symptoms of nephritis. More than 50 per cent of the children had enlarged tonsils and adenoids. The children were given three doses of 1 cc. of the stock serum at seven day intervals. After the third injection twenty-seven, or 20 per cent, had albuminuria. Mercer insists that urine examinations should be made in all cases before immunization. Until the manufacturers furnish a better preparation it should be given with caution. Patients with potential nephritis, patients with remission nephritis and children with throat trouble should not be given stock serum without careful study. Toxin-antitoxin is not "a harmless preparation" and should not be given to school children in a haphazard way.

Annals of Surgery, Philadelphia

89: 1-160 (Jan.) 1929

Congenital Anomalies of Duodenum with Obstruction at Duodenojejunal Angle: Two Cases. E. S. Judd and R. B. White, Rochester, Minn. —p. 1.
Atresia of Duodenum and Duodenal Diverticula. J. Kaldor, New York. —p. 6.
Tumors Which May Expand Curvature of Duodenum, Particularly Tumors and Infections of Retroperitoneal Lymph Nodes. C. E. Bird, Boston.—p. 12.
Benign Tumors of Duodenum: Six Cases. D. C. Balfour and E. F. Henderson, Rochester, Minn.—p. 30.
Duodenal Diverticula and Their Surgical Treatment: Ten Cases. R. W. McQuay, Toronto, Canada.—p. 36.
Affections of Appendix in Young Children: 100 Cases. E. W. Peterson, New York.—p. 48.
Malignancies of Colon. J. F. Erdmann and H. Clark, New York.—p. 54.
*Mortality Following Colostomy for Carcinoma of Large Bowel. F. W. Rankin, Rochester, Minn.—p. 62.
Care of Colostomy. G. E. Binkley, New York.—p. 71.
Carcinoma of Rectum and Rectosigmoid: 160 Cases. L. J. Hahn, New York.—p. 77.
*Intestinal Obstruction. C. J. Miller, New Orleans.—p. 91.
Mechanism of Fractures and Dislocations in Elbow Region. T. T. Thomas, Philadelphia.—p. 108.

Mortality Following Colostomy for Carcinoma of Bowel.—Rankin reviewed the records of 919 cases in which colostomy had been performed. Colostomy was performed in 385 cases in which further procedures were deemed impossible because of metastasis, extensive local involvement, or other factors that made it impossible to eradicate the malignant growth. In 584 cases, at exploration for colostomy, the growth was deemed resectable; however, in sixteen cases death occurred before the operation could be completed. Therefore, a mortality of 7.67 per cent attends the performance of colostomy as a palliative measure, and 2.7 per cent is the mortality rate of the operation in the group in which further operation is considered advisable. It is interesting to note that death in the hospital occurs in certain groups of cases consistently and that fixation and obstruction are predominant factors in cases in which death supervenes. The highest mortality was associated with acute obstruction, nearly half of these patients dying following the primary operation. Peritoneal, vesical and prostatic involvement was common, but apparently did not add particularly to the operative mortality. Multiple intestinal metastasis occurred in six cases with death in one, and metastasis to the mesenteric and inguinal lymphatics was noted in eleven cases, in which there were no operative deaths. In only six cases was resection considered inadvisable because of age, secondary anemia or general debility. Death followed colostomy in sixteen cases of the group deemed suitable for resection. Peritonitis accounted for ten deaths, while pulmonary complications were responsible for the other six, pulmonary embolism being the cause of death in two cases. Rankin says that unquestionably the growths which cause obstruction and which are manipulated at exploration are the source of most peritoneal contaminations; for this reason the abdomen should be explored before the growth itself is handled. Further proof that the growth is the source of infection in many instances lies in the fact that in graded operations on the colon or sigmoid, fatal peritonitis may result when there is no leakage at the line of anastomosis and resection at the second stage has been accomplished with perfect asepsis. The permeability of the wall of the bowel when there is obstruction is largely responsible for the increased likelihood of contamination. The adequate cleansing of the bowel before operation, and the institution of the proper measures for rehabilitation of the patient before and after operation, have contributed materially to satisfactory end-results.

Mortality of Intestinal Obstruction.—In the 343 cases analyzed by Miller, which include all instances of complete obstruction with the single exception of postoperative ileus

(nonmechanical obstruction), there were 209 deaths, a gross mortality of 60.9 per cent. The chief explanation of this mortality is delay in diagnosis and treatment, and patient, medical man and surgeon are all responsible for it. Intestinal obstruction has three phases, the mechanical obstruction with stoppage of the fecal current, the injury of the bowel wall with ultimate gangrene, and the production of toxins. The three principal symptoms are abdominal pain, vomiting and complete constipation, but any of these may be lacking in any case. A detailed diagnosis is not essential and the seriousness of the condition warrants exploration on mere suspicion. The condition of the patient rather than the procedure chosen determines the result of surgery, and it is better, generally speaking, to do too little than too much. In spite of the general belief to the contrary, this series proves that from every standpoint the results are better when general anesthesia, even ether, is employed in preference to local or spinal analgesia. The principal fact which emerges from this analysis of 343 surgical cases of intestinal obstruction is that prompt operation offers the only means by which the mortality of the condition can be brought within reasonable limits.

Archives of Internal Medicine, Chicago

43: 1-146 (Jan.) 1929

*Aneurysm of Coronary Arteries. M. Packard and H. F. Wechsler, New York.—p. 1.

*Effect of Roentgen Rays on Heart: II. Microscopic Changes in Heart Muscle of Rats and Rabbits Following Series of Exposures. A. S. Warthin and E. A. Pohle, Ann Arbor, Mich.—p. 15.

*Heart in Thyroid Disease: I. Changes in T Wave of Human Electrocardiogram Following Iodine Medication and Thyroidectomy. W. W. Hamburger, M. W. Lev, W. S. Priest and H. C. Howard, Chicago. —p. 35.

*Specific Serum Treatment in Chronic Ulcerative Colitis. J. A. Bargen, Rochester, Minn.—p. 50.

Relation of Hiatus Esophageus of Diaphragm to Stomach: Important Function of Pillars of Diaphragm. M. Joannides, Chicago.—p. 61.

*Normal Rhythm of White Blood Cells in Women. C. Smith and A. M. McDowell, South Hadley, Mass.—p. 68.

*Fatal Phenobarbital Poisoning: Case With Toxicologic Analysis. H. N. Wright, Minneapolis.—p. 85.

*Mustard Gas and Tuberculosis: Experimental Study. A. R. Koontz, Baltimore.—p. 90.

Normal Blood Determinations in South. M. M. Wintrobe and M. W. Miller, New Orleans.—p. 96.

*Experimental Bile Peritonitis and Treatment in Dog. O. H. Horrall, Chicago.—p. 114.

*Hyperbilirubinemia in Peptic Ulcer. M. Sturtevant and R. P. Wallace, New York.—p. 129.

Clinical Spirography: Spirograms and Their Significance. J. M. Nielsen and P. Roth, Battle Creek, Mich.—p. 132.

*Albuminuria in Mechanism of Detoxification. E. Andrews, W. A. Thomas and W. F. Welker, Chicago.—p. 139.

Aneurysm of Coronary Arteries.—Packard and Wechsler summarize twenty-nine case reports gathered from the literature and report one new case. The condition is three times as common in males as in females. In the vast majority of cases, the aneurysm is single and is usually situated on the left coronary artery within the first inch of its course. Rupture of the aneurysm took place in 50 per cent of the cases. Etiologically, the cases can be divided into two main groups: mycotic-embolic and arteriosclerotic. The mycotic-embolic aneurysms occurred in association with an acute or subacute bacterial endocarditis of the aortic valve. The average age was 27. In the arteriosclerotic group, a marked coronary sclerosis was present; the average age was 57. Syphilitic mesaortitis was found in only three cases in this series. Trauma plays an insignificant etiologic rôle. There were no pathognomonic symptoms or physical signs which made possible an antemortem diagnosis of the condition.

Effect of Roentgen Rays on Heart Muscle.—The precordiums of forty-eight rats and twenty-four rabbits (two or three in each group of twelve animals being kept as controls) were exposed by Warthin and Pohle to roentgen rays (the effective wavelength equaled 0.16 and 0.23 angstrom unit, respectively) three times at monthly intervals. The dose amounted to 600 R the first time and to 300 R each the second and third time. The animals were killed from eight to thirty-two days following the last exposure and the hearts examined microscopically. In every animal irradiated, definite lesions were found in the myocardium, consisting essentially of marked Zenker's necrosis and fatty degenerative infiltration. In many cases there was evidence of inflammatory reaction and early repair. These myocardial lesions were associated in every irradiated animal with a more or less severe bronchitis and bronchopneumonia and with other evidences of mediastinal roentgen-ray injury to the thymus, lymph nodes and ganglions. The authors regard the pulmonary infection as secondary to the irradiation injury of the bronchi, lowering the resistance and being followed by secondary bacterial infection. A vicious circle is therefore set up, increasing the myocardial change. They conclude, from these investigations, that definite injury of the heart muscle results from a series of exposures as described. This suggests caution in any case in which the treatment brings the heart in the path of the rays.

Heart in Thyroid Disease.—Hamburger et al. present the results of an electrocardiographic study of patients suffering from varying degrees of thyrotoxicosis, the study including the condition at the height of the disease before treatment, the changes in the electrocardiogram occurring during iodine medication, and the condition following operation. They conclude that iodine medication (compound solution of iodine [Lugol's solution]) in hyperthyroidism results in most instances in a diminution of the height of the T wave of the human electrocardiogram. The remaining cases did not show any change in the T wave. A few showed an increase in the height of the T wave. In one of the latter, symptoms of decompensation developed coincidentally. Subtotal thyroidectomy is followed by an even greater lowering of the T wave, in two cases progressing to inversion. Decrease in the basal metabolic rate proceeds parallel to a decrease in the height of the T wave following iodine medication and thyroidectomy. The variations in the height and form of the T wave described are probably to be explained both as variations in the tone of the regulatory cardiac nerves (vagus and sympathetic) and as alterations in the muscular state of the heart. Inversion of the T wave following thyroidectomy appears as a delayed inversion, in contrast to the immediate inversion occurring after the administration of digitalis and the cove-shaped inversion of coronary occlusion.

Specific Serum Treatment in Chronic Ulcerative Colitis.—Bargen reports seven cases treated with a filtrate prepared from the diplococcus of chronic ulcerative colitis. In all cases there was definite improvement in the general condition. The increase in weight soon after the institution of treatment with serum was significant. The serum seemed to have definite neutralizing power on the toxin of the organism causing chronic ulcerative colitis. The effect on the temperature and pulse curves is noteworthy. The outstanding improvement, as shown by the proctoscope and by roentgenograms of the colon by barium enema, is of the greatest significance. The immunization of horses is being continued. Better results are anticipated for the future. The results in this small series of almost hopeless cases are encouraging. They suggest that the present method of treatment is in the right general direction. At least two of these cases illustrate the futility and impracticability of ileosigmoidostomy in the treatment of patients with chronic ulcerative colitis.

Normal Rhythm of Leukocytes in Women.—A study was made by Smith and McDowell to determine whether or not the physiologic process of menstruation may influence the regular daily rhythm of the white blood cells, which has been shown to exist independently of other physiologic factors such as digestion and ordinary exercise. In the course of this investigation, it was found that a type of cell identified as a young eosinophil was present, which was basophilic in reaction and which was closely allied to the lymphocytic group of blood cells. The evidence presented indicates that the small basophil may be an intermediate stage in the development of certain eosinophils of lymphocytic origin. The characteristics of the normal rhythm of the white blood cells previously described have been confirmed in general, except that it is not believed that cells die in the peripheral circulation to such an extent that the neutrophilic curve is influenced by them. The number of white blood cells varies within certain limits. These limits are different in different persons; under normal conditions, they are constant in a given person. The curves representing the daily rhythm of the white blood cells have a characteristic pattern for each person. The number and rhythm are essential characteristics of the white blood cell picture and are not caused

or fundamentally modified by normal physiologic processes (digestion, menstruation) or different physiologic states of the normal body (mild fatigue, moderate exercise).

Fatal Phenobarbital Poisoning.—A case of fatal poisoning from phenobarbital is reported by Wright, and a method is presented for the toxicologic analysis of phenobarbital, including its extraction and identification from the stomach, liver and brain. Phenobarbital does not appear to be excreted in the urine in cases of acute poisoning.

Mustard Gas and Tuberculosis.—The question of a possible causal relationship between exposure to the various war gases and the development of pulmonary tuberculosis has agitated the minds of both the medical profession and the laity from the time of the earliest use of these gases. Both the medical profession and the laity believed at first that soldiers who had been gassed would be especially susceptible to pulmonary tuberculosis. Subsequent facts did not justify this fear. Koontz conducted an extensive series of experiments, as opportunity presented, dealing separately with each of the principal war gases and using small doses of bacilli in order to determine just what inhibitory effect, if any, they might prove to have on the development of pulmonary tuberculosis. Mustard gas was the first gas investigated. One hundred and sixty-eight rabbits were inoculated in the vein of the ear with virulent human tubercle bacilli. Half of the animals were gassed for one hour with approximately the lethal dose of mustard gas; the other half were kept as controls. From six to ten weeks after their inoculation, all the animals were killed, autopsies performed, and the viscera studied for tuberculous lesions. Sixty-four per cent of the animals that had been gassed had pulmonary tuberculosis; 83 per cent of the controls had pulmonary tuberculosis. The tuberculous process was much more extensive in the control animals that developed the disease than in the gassed animals that contracted it. These experiments clearly demonstrate that gassing with mustard gas has an inhibitory effect on the development of pulmonary tuberculosis in rabbits.

Experimental Bile Peritonitis.—The effect of autogenous bile free in the peritoneal cavity was studied by Horrall to determine whether bacteria are the sole harmful agents or whether they do not have any relation to the symptoms and the condition found at autopsy in bile peritonitis; what will be the effect of bile continuously pouring out into the peritoneal cavity; what difference in symptoms will be produced by varying the quantity of bile, and what effect bile from other dogs will produce when injected into the peritoneal cavity. Bile from the gallbladder was spilled into the peritoneal cavity in twenty-five dogs. There were no deaths, and the effects were slight and transitory. Some of the dogs vomited, a few had diarrhea, and the urine contained varying amounts of bile pigment. The amount of jaundice present was just perceptible. Bacteria were not the cause of these symptoms, as sterile or infected bile gave the same results. Intraperitoneal fistula of the gallbladder in seven dogs permitted sufficient bile to pass into the peritoneal cavity to cause death within twenty-four hours. If the fistula was partly closed, the dog lived longer, and if it was completely closed early, the effects were transitory. The symptoms preceding death were bradycardia, low blood pressure, slow respiration, anuria and coma, and in many cases edema. Intraperitoneal injection of bile from the gallbladder of dogs into nine dogs in amounts of 5 cc. or more per kilogram of body weight caused death within twenty-four hours. Sterilized bile had the same effect. From this series of experiments, it seems that bile peritonitis is a clinical entity. Calcium chloride and calcium lactate neither inhibit nor diminish the toxic action of bile. Olive oil accelerates the toxic action of bile. Cholesterol and lecithin slightly inhibit the toxicity of bile. Epinephrine and ephedrine have favorable effects, but these effects are exceedingly transient. Physiologic solution of sodium chloride given intraperitoneally, intravenously or subcutaneously has the most favorable effect on the course of the disease. Early diagnosis and immediate operation are imperative.

Hyperbilirubinemia in Peptic Ulcer.—Conflicting reports as to the occurrence of latent and actual jaundice in persons with duodenal ulcer led Sturtevant and Wallace to investigate twenty-three cases of duodenal and gastric ulcer in which roentgen and other examinations did not reveal evidence of a pathologic condition of the gallbladder or biliary duct or adhesions in the upper part of the abdomen. Determinations of bilirubin in the blood serum of these patients showed a normal amount in every instance. This confirms the observations, in the smaller series, of Friedman and Strauss. These results would tend to support the suggestion that jaundice when present in persons with duodenal ulcer is caused by periduodenal adhesions, catarrhal inflammation of the duodenum or a complication in the biliary system.

Albuminuria in Mechanism of Detoxification.—The urine of nephritic persons contains, besides the normal blood proteins, a relatively nontoxic peptone combined or absorbed by serum proteins and also a highly toxic blood protein so widely dispersed in solution as to pass readily through a collodion membrane. The hypothesis is presented by Andrews et al. that albuminuria is a detoxicating mechanism for eliminating poisonous products of protein metabolism.

Journal of Urology, Baltimore

21: 1-143 (Jan.) 1929

Malignant Disease in Diverticula of Bladder. V. C. Hunt, Rochester, Minn.—p. 1.
*Diverticulitis of Sigmoid as Source of Bladder Irritation. A. L. Chute, Boston.—p. 13.
Ureter as Possible Origin of Certain Diverticula of Bladder. J. R. Caulk, St. Louis.—p. 23.
*New Method of Paravertebral Anesthesia for Kidney Operations: Thirty-Three Cases. R. B. Henline, New York.—p. 27.
Nephrectomy Under Spinal Anesthesia with Particular Reference to Nephrectomy in Renal Tuberculosis. H. S. Jeck, New York.—p. 61.
Ephedrine Controlled Spinal Anesthesia. N. F. Ockerblad and T. G. Dillon, Kansas City, Kan.—p. 77.
*Treatment of Teratoid Tumors of Testis with Radium and Roentgen Ray. A. L. Dean, Jr., New York.—p. 83.
Ureteral Stump (Nontuberculosis) as Source of Pyuria: Case. J. S. Read, New York.—p. 103.
*Unilateral Renal Chyluria. A. H. Wood, Baltimore.—p. 109.
*Rare Anomaly of Ureter. F. R. Hanlon, Rochester, Minn.—p. 123.
Leiomyosarcoma of Bladder: Case. B. H. Hager and V. C. Hunt, Rochester, Minn.—p. 129.
Cysts of Tunica Albuginea (Cysts of Testis). K. Frater, Rochester, Minn.—p. 135.
Revolver Bullet Imbedded in Shaft of Penis. C. O. Ritch, Chicago.—p. 141.
New Aseptic Stopper. E. W. White, Chicago.—p. 143.

Diverticulitis of Sigmoid as Source of Bladder Irritation.—Once the question of a diverticulitis of the sigmoid has been raised, Chute says that the diagnosis can usually be confirmed by a series of roentgenograms taken after a barium enema. The contracted, spastic sigmoid, with the dilated rectum below and the dilated colon above, indicating a diverticulitis rather than a diverticulosis and therefore a sensitive sigmoid, is suggestive, as is the condition seen after the enema has been expelled, in which little blotches of barium are seen much lower in the pelvis than is the case when the rectum is full; it is in this position that the sensitive sigmoid rests on the bladder. The treatment of the condition must be palliative in practically all cases, a diet being given that leaves a relatively small residue, and the lower bowel and the small diverticula kept free of decomposing material by means of laxatives and enemas.

New Method of Paravertebral Anesthesia for Kidney Operations.—Henline favors combined paravertebral and local anesthesia as the anesthesia of choice in renal surgery. Preliminary medication is given consisting of three doses of one-eighth grain (0.008 Gm.) of morphine sulphate in an ampule containing 2 cc. of a 50 per cent solution of magnesium sulphate in procaine at half hour intervals before operation. A 1 per cent procaine solution without epinephrine gives the most satisfactory results. Any benefit claimed for epinephrine is more than offset by its increased toxicity. This solution is injected both above and below the transverse process of the vertebrae from the eighth dorsal to the second lumbar inclusive, 5 cc. being injected above and below each, except for the two lumbar nerves, where 10 cc. is used. This is supplemented by a splanchnic analgesia and infiltration along the line of incision. By thus blocking each nerve twice along its course and using only a safe amount of procaine, more perfect anesthesia should be obtained. The advantages to the patient are many: Fluids may be taken before, during and after operation; the anesthesia persists for an average of three and one-fourth hours after operation; less postoperative opiates are required and some patients are comfortable without any narcotic; pulmonary com-

plications are diminished; abdominal distention is less frequent and severe; nausea and vomiting are rare; the mortality rate is lessened, and convalescence begins when the patient leaves the operating table. Because of the gentleness with which tissues must be handled, better surgery is done. Relaxation of the tissues is complete. Renal surgery may be performed on any patient regardless of any coexisting disease with less danger than under any other anesthesia. The method of anesthesia has been proved experimentally and clinically to be practical, and successful anesthesias should be expected in at least 90 per cent of kidney operations. No pain is experienced when the kidney is gently dissected free from its bed or when the renal pedicle is clamped and tied.

Treatment of Teratoid Tumors of Testis with Radium and Roentgen Ray.—In a study made by Dean of the etiologic factors in 124 teratoid tumors of the testis, direct trauma preceded tumor formation in 11 per cent of the cases. The first symptom in 92 per cent of the cases was a painless swelling of the testis. Treatment with external irradiation by means of the high voltage roentgen ray and by radium packs gave the following results: (*a*) Of sixteen patients who were classified as operable when first seen, thirteen, or 86 per cent, do not have any signs of disease; (*b*) of ninety-seven patients who were classified as inoperable when first seen because of the presence of inoperable recurrences, metastases, or both, 29 per cent do not have any signs of disease.

Unilateral Renal Chyluria.—A case of chyluria, left renal in origin, is reported by Wood. Searches for parasites, ova and hooklets in the blood, urine and stools were negative. There was no eosinophilia. The chyluria first occurred at the age of 15, and cleared up without treatment. It recurred at the age of 71; during the last recurrence, posture influenced but did not control the condition. The differential phenolphthalein determinations showed the left kidney output to be increased over the opposite side, which was explained by the right sided nephrosis. The pyelogram of the left kidney (chyluria side) showed what was interpreted as being an apparent communication between the extrarenal pelvis and the juxta-aortic lymph nodes. On the right side no such communication was seen. The chyluria ceased after pyelography; no other treatment was instituted. It has not recurred.

Rare Anomaly of Ureter.—In the case reported by Hanlon the left kidney possessed two distinct pelves. The ureters were completely duplicated and terminated with separate orifices in the bladder. The right kidney was normal in size and had one pelvis and one ureter. When the bladder was opened two ureteral orifices were noted on the right side. On probing the accessory orifice it was found to end blindly 3.8 cm. above the point of origin.

Northwest Medicine, Seattle

28: 1-48 (Jan.) 1929

Bone Tumors: Correlation of Pathologic and Roentgen Findings in Their Diagnosis. D. B. Phemister, Chicago.—p. 1.
*Undulant or Malta Fever in Oregon. G. C. Bellinger, Salem, and W. Levin, Portland.—p. 9.
*Id.: Fatal Case in Oregon. E. J. Jasper, Astoria.—p. 14.
Cardiovascular Syphilis. H. J. Templeton, Oakland, Calif.—p. 16.
Prognosis in Acute Coronary Occlusion. A. L. Severeide, Portland.—p. 18.
Acute Pancreatitis: Three Cases. P. W. Willis, Seattle.—p. 20.
Carcinoma of Esophagus. J. E. Else, Portland.—p. 25.
Next Step in Cancer Education. O. B. Wight, Portland.—p. 27.
Headache and Eyestrain. A. B. Dykman, Portland.—p. 29.
*Malarial Treatment of Neurosyphilis: Preliminary Report. F. J. Clancy, Seattle.—p. 32.
Newspaperman's Impression of Medical Profession. W. W. R. May, Portland.—p. 35.
*Epidemic Pemphigus Neonatorum (Impetigo?): Treatment. J. A. Keho, Tacoma.—p. 37.

Malta Fever in Oregon.—An outbreak of undulant fever at the Oregon State Tuberculosis Hospital was found to have been caused by *Brucella abortus*. These are the first recorded cases in Oregon. In forty-five specimens received at the state hygienic laboratory for the Widal test, in which typhoid or paratyphoid alone was suspected, five specimens, or 11 per cent, gave diagnostic agglutination with *B. abortus*. In a series of 422 Wassermann serums subjected to the *B. abortus* agglutination test, twenty-eight, or 6.6 per cent, gave complete agglutination in a 1:20 dilution; seven, or 1.7 per cent, gave complete agglutination in a 1:40 dilution, and three, or 0.7 per cent, gave complete agglutination in a 1:80 dilution. In the series of cases at the state tuberculosis hospital, four gave complete agglutination with *B. abortus* in low dilutions; yet clinically the cases were undeniably undulant fever. Bellinger and Levin emphasize that both laboratory and clinical evidence must be obtained to rule out diseases with which it may be confused, and then laboratory evidence must be obtained to support the diagnosis of undulant fever. Undulant fever is caused by the ingestion of raw milk or cream from cattle infected with the organism causing contagious abortion, *B. abortus*. Since the organisms are destroyed when heated to 142 F. for fifteen minutes, infection in man may be prevented by the proper pasteurization of milk and cream.

Id.—Jasper reports one case of malta fever in which the infection undoubtedly came from cow's milk. He thinks that the disease has in all probability existed in Oregon for many years without being recognized. That there must be a strong natural immunity to the disease is quite evident or more people would be affected. It is suggested, however, that in the future in all cases of obscure fever, slight, remittent or otherwise which present difficulty in diagnosis and in cases of typhoid, a blood culture be taken and subjected to the agglutination test for *Brucella melitensis*. Pasteurization of milk would be a good public health measure.

Malarial Treatment of Neurosyphilis.—Clancy reports on 138 cases. In some of the cases the results obtained were most striking. Some of the cases in which improvement was hardly to be expected came into a full remission and have remained so for the past year. In some of the cases in young, vigorous adults who were excellent malarial risks, no improvement was obtained. In twenty-eight cases complete remissions resulted and the patients were discharged from the hospital; nine patients are ready for discharge; thirty-six were improved; thirty-five were not improved, and twenty died.

Treatment in Epidemic of Pemphigus Neonatorum.—Keho uses a 1 per cent oleate of copper ointment, prepared with lard or olive oil, for the removal of the vernix caseosa, when he feels that the child is infected at the time of birth before the organism has invaded the child's skin, as well as before it has been distributed to other infants in the nursery. During an epidemic in one hospital, this ointment was used for the removal of the vernix from each child that came to the nursery. On these no vesicles appeared. On those that were already affected, the skin cleared up in a few days after its use. There has not been any epidemic in that hospital since.

Pennsylvania Medical Journal, Harrisburg

32: 211-306 (Jan.) 1929

*Chronic Ulcerative Colitis. H. B. Stone, Baltimore.—p. 211.
Treatment of Heart Affections: Prevention. F. J. Dever, Bethlehem.—p. 219.
Id.: Rest and Exercise. A. H. Colwell, Pittsburgh.—p. 221.
Ouabain in Treatment of Cardiac Failure. L. H. Criep, Pittsburgh.—p. 223.
Mesenteric Adenitis. J. Speese, Philadelphia.—p. 225.
Tracheobronchial Lymphadenitis and Associated Lesions. L. M. McPhedran, Philadelphia.—p. 228.
Relationship Between Upper and Lower Respiratory Tracts. G. C. Kneedler and M. W. Kneedler, Pittsburgh.—p. 234.
Gastric Hemorrhage: Internist's Point of View. T. G. Miller, Philadelphia.—p. 237.
Id.: Hematology. C. E. Ervin, Danville.—p. 241.
Id.: J. H. Gibbon, Philadelphia.—p. 242.
Acute Intestinal Obstruction: Diagnosis. H. H. Donaldson, Pittsburgh.—p. 244.
Id.: Mechanism of Death. T. K. Kruse, Pittsburgh.—p. 246.
Id.: Treatment. E. L. Eliason, Philadelphia.—p. 249.

Ileostomy in Chronic Ulcerative Colitis.—Stone reports seven cases in which ileostomy was performed after other treatment had obviously failed. Four patients are apparently well for periods ranging from one to six years; one developed a fatal recurrence two years after apparent cure; one died almost at once after operation, and the fourth is subjectively well, but the lesions still exist.

Tennessee State Med. Assoc. J., Nashville

21: 333-370 (Jan.) 1929

Diagnosis and Treatment of Brain Tumors. T. D. McKinney, Nashville.—p. 333.
Determination of Presence of Insanity. J. W. Stevens, Nashville.—p. 338.
Gas Gangrene. A. R. Porter, Jr., Memphis.—p. 344.
Penetrating Injuries of Eye. R. H. Newman, Knoxville.—p. 348.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British J. Children's Diseases, London

25: 237-327 (Dec.) 1928

*Congenital Stenosis of Esophagus. C. C. Beatty.—p. 237.
*Rheumatic Child. N. G. Hill.—p. 270.
White "Nevus" of Ocular Conjunctiva in Child, and Dark Blue Nevus of Forehead. F. P. Weber.—p. 276.
Erosion of Neck Vessels in Scarlet Fever: Two Cases. J. D. Rolleston and W. G. Sears.—p. 281.

Congenital Stenosis of Esophagus.—Beatty presents a summary of fifty recorded cases, gives in detail two personal cases and two others from postmortem records which have not previously been reported, and analyzes three anatomic museum specimens, making a total of fifty-seven cases. His two patients were children, aged 2 and 5 years, respectively. The other two were adults, aged 42 and 38 years, respectively. He says that if congenital esophageal stenosis is diagnosed in infancy or early childhood, it is usually inexpedient to attempt dilatation or any operative treatment. Attention should be directed solely to maintaining the nutrition by means of fluids. No attempt should be made to give solid food when it has been demonstrated that solids are unable to pass the narrowed portion. The diet should consist only of fluids and jellies, and the feedings should be small and frequent.

Rheumatic Child.—Hill contends that there are no physical characteristics that are peculiar to rheumatic children other than those that are the outcome of the disease, and the belief that there is a rheumatic type cannot be substantiated. There is little, if any, connection between the life and work at school and the onset of rheumatism or chorea.

British Medical Journal, London

1: 89-138 (Jan. 19) 1929

*Treatment of Empyema. F. G. Thomson.—p. 89.
*Prognosis and Treatment of Eclampsia and Albuminuria: Risk of Recurrence in Subsequent Pregnancies. J. Young.—p. 91.
*Present Position of Ultraviolet Ray Therapy. C. B. Heald.—p. 94.
*Abdominal Aneurysm Causing Thrombosis of Inferior Vena Cava. K. P. Fooks.—p. 97.
Occupational Pressure Neuritis of Deep Palmar Branch of Ulnar Nerve. W. Harris.—p. 98.
Pyorrhea Alveolaris. H. Humphreys.—p. 99.
Pedigree of Amaurotic Family Idiocy (Tay-Sachs Disease). D. D. S. Stewart.—p. 101.
*Complete Inversion of Urinary Bladder. C. B. Pasley.—p. 102.
*Chylous Mesenteric Cyst. G. I. Wilson.—p. 102.
Electrotherapy in Nongonococcic Cervicitis. C. F. O. White.—p. 103.
Pseudocyst of Pancreas. H. A. Warnock.—p. 104.
Variations in Blood Urea Content. G. Brown.—p. 104.
Idiosyncrasy to Quinine Injections. A. G. Cruikshank.—p. 104.
Paresis of Motor Oculi Nerve. D. G. Robinson.—p. 105.

Treatment of Empyema.—Thomson favors continuous suction drainage by means of a self-retaining rubber catheter, which is introduced directly through a small incision into the chest or through a cannula, which is withdrawn as soon as the drainage tube has been inserted. He has had an oval trocar and cannula specially made to enable a larger catheter to be introduced between the ribs than would otherwise be possible. Irrigation of the cavity by surgical solution of chlorinated soda, two or three times a day, seems to soften or disintegrate those large masses of fibrin which so often impede the free passage through the tube. If the latter appears to be blocked, it is detached from the suction apparatus and, by means of a glass syringe, the solution is alternately forced gently through the tube and sucked out again. By doing this a large amount of fibrin can often be removed, and when the suction apparatus is replaced drainage is found to proceed quite satisfactorily. Once drainage is satisfactorily started very little attention is required, unless the tube gets blocked and requires syringing out, as it occasionally does. Irrigation with some antiseptic ought to be carried out at least two or three times a day, no matter what method of drainage is adopted. Thomson has treated twelve patients with empyema by this method. Of these patients, one, a man, aged 35, who had a large chronic empyema of about five months' duration, died as the result of multiple cerebral abscesses three weeks after admission, and while the empyema was still draining. The other eleven have all done uniformly well. After removal of the catheter he has, in all cases, put a fine tube into the sinus to drain the small cavity remaining. The sinus is usually healed completely after three or four days, but in four patients the wound, after closing up, has broken down again, and a small abscess has discharged, after which the sinus has again closed up and given no further trouble. In all cases except one, the cure has been complete and permanent. The average period during which drainage has been required is nineteen days. One particularly satisfactory feature in all cases has been the rapid expansion of the lung, as shown by the amplitude of respiratory movements on the affected side, and the return of breath sounds at the base.

Recurrence of Eclampsia and Albuminuria.—In a series of hospital patients treated for eclampsia and albuminuria, Young found a recurrence of toxemia or nontoxemia, or interruption of pregnancy (abortion and accidental hemorrhage) in succeeding gestations, in more than 50 per cent. There is no evidence that this tendency to recurrence is directly or indirectly dependent on any persisting renal defect. Chronic nephritis was found in only a small proportion of cases, and there was evidence that this is the result of the toxemia. In view of the large risk of recurrence, Young feels that the need for antenatal supervision from an early stage in the event of a subsequent pregnancy should be clearly explained to the patient. Toxemia in two or more pregnancies is an indication for the prevention of any further pregnancy.

Present Position of Ultraviolet Ray Therapy.—Heald gives a list of twenty-seven diseases in which he feels that ultraviolet ray therapy is of value. In only seven of these is his estimate of value as high as 75 per cent or more; namely, bursitis, burns, debility, furunculosis, tuberculous glands, lupus and rickets.

Abdominal Aneurysm Causing Thrombosis of Inferior Vena Cava.—Fooks relates the case of a man, aged 35, who at the age of 18, having previously been in good health, was treated for iritis, which followed a blow on the eye. The iritis cleared up rapidly under treatment. Two years later he complained of swelling of both legs, the onset being sudden and accompanied by pain in the legs. A diagnosis of bilateral femoral thrombosis was made, but no local or general cause was discovered. There was no clinical evidence of syphilis, but the Wassermann reaction was not determined. After some weeks the legs ulcerated and the edema diminished. During the ensuing six years he had several transient recurrences of edema, but no pain occurred with these attacks. Later he began to have difficulty in walking of the type associated with intermittent claudication. This symptom persisted to a variable extent for the rest of his life. Large veins appeared over the abdomen and the ulcers healed. Later he complained of severe aching pains in the lower part of the back, and he was found to have the large superficial venous collateral circulation typical of obstruction of the inferior vena cava. There was tenderness over the lower lumbar spines, and a bilateral extensor plantar response. The Wassermann reaction was negative. Thrombosis of the inferior vena cava, with a light degree of myelitis, was diagnosed, the myelitis being thought to be due to a local impoverishment of the blood supply secondary to the thrombosis. The pain disappeared under electrical treatment, and the patient returned to work. He remained free from pain until 1927, when he had a recurrence of symptoms, of a short duration, similar in every respect to those of 1921. Four weeks before admission he had a similar recurrence of pain of very great severity, especially located in the left side of the abdomen. The pain caused complete insomnia, and after two weeks of acute distress a swelling appeared in the left groin, followed by numbness and uselessness of the left leg. Violent nocturnal stabbing pain arose, shooting down the left thigh. Thirty-six hours after admission he had an attack of agonizing pain shooting down the left leg, the abdominal distention increased, and vomiting and collapse occurred. From that time until death the pain recurred at intervals, necessitating the frequent use of morphine, and the radial pulses became very thin and rapid, being imperceptible at times. The swelling in the groin gradually diminished, and the left common femoral pulse was felt for a few hours on the third day. On the fourth day a large mass became visible and palpable in the left side of the abdomen, extending from the costal margin to the iliac crest, and from

the left kidney region to within 3 inches of the umbilicus, and exhibiting pulsation of an expansile character. A soft systolic murmur was audible over the swelling. A roentgen examination at this time did not show any sign of abdominal aneurysm, but a lateral view was impossible. The swelling increased steadily until it filled the greater part of the left side of the abdomen and the meteorism subsided. A spreading discoloration of the skin of the left loin and groin appeared. The day before death, which occurred a week after admission, a collection of fluid was detected in the left pleural cavity, but it was not tapped, as the patient was dying. At the necropsy there was found, at the bifurcation of the aorta, a large sacular aneurysm which had eroded the bodies of the fourth and fifth lumbar vertebrae to within half an inch of the spinal canal. The posterior wall of the aneurysmal cavity was formed by this eroded surface, and on the left side the junction of the sac with the lip of the vertebral hollow had broken down, allowing the escape of blood into the retroperitoneal tissues, where a huge hematoma was formed. The swelling in the left groin was due to this extravasation of blood tracking down the psoas muscle. The inferior vena cava was indistinguishable 2 inches below the renal veins, where it became stretched out over the sac of the aneurysm as a fibrous band. The femoral and iliac veins were represented by thick fibrous cords partly recanalized by small vessels running outward near the bifurcation of the aorta, apparently into the lumbar veins. The arteries of the legs were patent, but a loose mass of laminated clot was partly blocking the openings from the aneurysm into the common iliac arteries. The heart was normal, and the aorta did not show any aortitis or atheroma. The other organs were examined and found to be healthy. No signs of syphilitic infection were found. In the left pleural cavity, a quantity of blood was discovered that had tracked up through the crura of the diaphragm.

Complete Inversion of Urinary Bladder.—Pasley reports the case of a rather poorly nourished Chinese girl, aged 15, with a facies suggestive of hereditary syphilis, who sustained a complete inversion of the urinary bladder. The urethra easily admitted the thumb. No cause for the condition was discovered. The bladder was replaced manually several times. Finally, to effect a permanent cure, Pasley operated. The space of Retzius was freely opened up. The peritoneal reflection from the anterior surface of the bladder was defined and drawn upward. The bladder was gently grasped with rubber-protected forceps and drawn upward. The posterior aspect of the symphysis pubis was lightly scarified. The anterior surface of the neck of the bladder was rubbed with gauze and then firmly sutured to the pubis. The wound was closed without drainage, and dry dressings were applied.

Chylous Mesenteric Cyst.—Wilson's patient was 8 years of age. He was referred "for relief by laparotomy of ascites due to tuberculous peritonitis." The abdomen was opened through a subumbilical incision, but no fluid was found. Across a soft, white, cystic swelling was stretched a band of small intestine, of rather a bluish color. The swelling extended upward, pushing the transverse colon, great omentum and stomach well up under the diaphragm. Laterally, the cyst extended behind both ascending and descending portions of the colon; it was pouched in the flanks, thereby becoming trilocular, but all parts communicated freely. Four and a half pints of fluid, exactly resembling milk, was drained off. A certain quantity of fluid was left behind, probably less than a pint. The abdomen was closed. Convalescence was uneventful. Nine weeks later there seemed to be definite evidence of a flaccid cyst in the abdomen. Wilson thinks that the fluid is collecting again very slowly.

Journal of Pathology and Bacteriology, Edinburgh

32: 1-172 (Jan.) 1929

Focal Necrosis of Liver. J. W. Edington.—p. 1.
*Chronic Peptic Ulcer of Esophagus. M. J. Stewart and S. J. Hartfall.—p. 9.
"Smooth-Rough" Variation in Bacteria in Relation to Bacteriophage. F. M. Burnet.—p. 15.
*Retroperitoneal Ganglionic Neuroma. D. F. Cappell.—p. 43.
Tuberculin. H. J. Parish and C. C. Okell.—p. 51.
Relationship Between Hemolytic Complement and Opsonic Power of Normal Guinea-Pig Serum. J. Gordon, H. R. Whitehead and A. Wormall.—p. 57.
Nervous System in Rats Fed on Diets Deficient in Vitamins B 1 and B 2. R. O. Stern and G. M. Findlay.—p. 63.
*Diabetes Mellitus with Acromegaly and Lipemia. J. Gray.—p. 71.
Isolation of Bacterium Morgani from Mammals, Birds and Reptiles at Zoological Gardens. R. Lovell.—p. 79.
Intestinal Bacilli: Smooth and Rough Races. P. B. White.—p. 85.
*Diffuse and Nodular Fibrosis of Adventitia of Aorta (Rheumatic Periaortitis). W. G. Barnard.—p. 95.
Generalized Vaccinia in Rabbits: Lesions in Internal Organs. S. R. Douglas, W. Smith and L. R. W. Price.—p. 99.
Standardization of Antidysentery Serum: Effect of Increased Test Dose of Toxin on Accuracy of Titration. A. V. Blake and C. C. Okell.—p. 121.
Testing of Antidysentery Serums. J. W. Trevau.—p. 127.
Siderosis of Globus Pallidus: Relation to Bilateral Necrosis. G. Hadfield.—p. 135.
Experiments on Nature of Carcinogenic Agents in Mineral Oils. C. C. Twort and J. D. Fulton.—p. 149.
Neuroglial Tumor of Spinal Cord. W. G. Barnard.—p. 163.
Simple Method of Preparing Accurate Pen-and-Ink Drawings of Specimens. T. Shennan.—p. 164.

Chronic Peptic Ulcer of Esophagus.—A case of chronic peptic ulcer of the lower end of the esophagus is reported by Stewart and Hartfall. It is said to be the first encountered in more than 10,000 necropsies performed in eighteen years. The chief symptoms were high epigastric pain of five months' duration and recurrent hematemesis for a fortnight: dysphagia was not a prominent system. Death was due to perforation of the ulcer into the right pleural sac. An interesting feature of the case was the presence in the upper part of the esophagus of two large patches of heterotopic gastric mucous membrane of fundal type; the possible relationship of this developmental abnormality to chronic peptic ulceration of the esophagus is discussed.

Retroperitoneal Ganglionic Neuroma.—Cappell records a case of an unusually large ganglionic neuroma which presents throughout a uniform structure of adult ganglionic cells and nerve fibers. The majority of the fibers were of nonmedullated type and the remarkable feature was their enormous number. The tumor weighed 1,020 Gm. and is said to be the largest on record.

Diabetes Mellitus with Acromegaly and Lipemia.—In a fatal case of diabetic coma, presenting also certain features of acromegaly, the following lesions were noted postmortem by Gray: lipemia, consequent mononuclear hyperplasia in spleen, pancreatic, hepatic and renal cirrhosis, cholelithiasis, chromophobe adenoma of pituitary gland, gastric catarrh with multiple gastric ulcers and hemorrhage into the stomach.

Diffuse and Nodular Fibrosis of Adventitia of Aorta.—Barnard relates the case of a man, aged 23, who as a schoolboy had growing pains and rheumatism in the left shoulder. At 14 he was treated in a hospital for precordial pain and dyspnea; at 20 he was treated for cardiac failure. On admission he was pale and thin, looked ill, and showed the signs of gross cardiac failure. He was orthopneic; the veins of the neck were engorged; the lungs were congested; the liver was enlarged, and the ankles were edematous. The heart was greatly enlarged, the apex beat being in the anterior axillary line; a loud to-and-fro murmur was heard over the apex and base and the pulse was water-hammer in type. There were no signs of bacterial endocarditis. The pulse was regular and rapid, remaining about 120 a minute; the systolic blood pressure was 120 mm. of mercury. The temperature varied between 98.4 and 101 F. He died two days after admission. The adventitia of the aorta was everywhere greatly thickened by fibrous tissue measuring 3 mm. near the heart and up to 10 mm. in the lower part of the thoracic aorta. In places this had become condensed in such a way that the aorta appeared to have been found with thick cord. Fibrous tissue was present between the bands but here it was less dense, so that when the aorta was opened the cut bands stood out prominently as milky-white nodules. The fibrosis was limited to the adventitia and apart from small patches of atheroma both the intima and the media appeared normal and together measured 1.5 mm. in thickness. This change extended from the heart to the bifurcation of the aorta but was most marked in the thoracic region. It was continued to a slight extent round the branches and particularly round the branches of the abdominal aorta, which were surrounded by a somewhat less dense but wide zone of fibrous tissue.

Journal Tropical Medicine and Hygiene, London

32: 1-16 (Jan. 1) 1929

Certain Bronchomycoses Which May Simulate Pulmonary Tuberculosis. A. Castellani.—p. 1.

Annales de l'Institut Pasteur, Paris

42: 1489-1687 (Dec.) 1928

Liposoluble Bismuth. C. Levaditi.—p. 1489.
Pneumococcal Hemolysin. L. Cotoni and N. Chambrin.—p. 1536.
Reaction of Nervous System to Tar. M. Marullaz.—p. 1573.
*New Technic of Flocculation Test in Syphilis. A. Scaltritti.—p. 1600.
Use of Lipoids Precipitated with Cadmium Chloride as Antigen in Bordet-Wassermann Reaction. A. Scaltritti.—p. 1608.
Close Relationship Between Bacillus Pestis and Pseudotuberculosis Bacillus of Rodents. S. I. Zlatogoroff and B. I. Moghilewskaja.—p. 1615.
New Method for Preparation of Antirabic Vaccine and Serum. A. W. Ponomareff and N. N. Solovieff.—p. 1661.

New Technic of Flocculation Test in Syphilis.—Scaltritti uses for his flocculation test for syphilis 0.1 cc. of the inactivated serum of the patient and 0.05 cc. of his new antigen, prepared by precipitating pig heart lipoids with cadmium chloride. In several hundred syphilitic patients and in as many healthy persons and persons with various diseases, he obtained a very definite reaction, corresponding exactly to the results of control complement fixation or flocculation tests by other methods (Meinicke and Vernes) and to the clinical observations.

Archives des Maladies du Cœur, etc., Paris

21: 705-768 (Nov.) 1928

*Pathogenesis of Diathetic Arterial Hypertension. L. Bard.—p. 705.
*Atropine Test in Extrasystole. G. Marchal and R. Heim de Balsac.—p. 717.
Orthostatic Sino-Auricular Block. L. Gallavardin.—p. 740.

Pathogenesis of Diathetic Arterial Hypertension.—Bard designates essential arterial hypertension as diathetic, meaning by diathesis the arthritic constitution of the old conception. He considers this type of hypertension to be a manifestation of the adaptation of the circulatory system to the characteristic peculiarities of the basal metabolism of diathetic patients. He believes that there exists a certain optimum of cellular and humoral pressure for each individual, as well as that there are certain chemical (p_H) and temperature optimums that are subject to but slight variations in the same person and are governed by the products of the basal metabolism of the individuals, acting through the vegetative nervous system. In certain cases these slight oscillations of the optimums become permanently fixed in one direction or another corresponding to permanent changes in the basal metabolism of the individual. Unless this newly established higher blood pressure becomes harmful by overworking the heart, Bard does not use hypotonic medication in diathetic arterial hypertension, but corrects the basal metabolism by appropriate dietetic and hygienic measures.

Value of Atropine in Extrasystole with Slight Continuous Bradycardia.—Marchal and Heim de Balsac communicate the results of the prolonged observation (more than a year) of a case of extrasystole with slight continuous bradycardia in a man, aged 53. Neither valvular nor myocardiac lesions were found, but the atropine test revealed the presence of a general vegetative hypotonia. For this reason the patient was given atropine (0.25 mg.) and epinephrine (1 mg. daily); and the treatment was controlled by repeated atropine tests. On the fifteenth day the third atropine test showed a marked amelioration of the hypotonia (40 and 84 instead of 35 and 75), and the dose of atropine necessary to produce the maximum acceleration of the pulse decreased gradually from 2 mg. in the first test to 1.25 mg. in the third test. At the same time the cardiac rhythm rose from 40 in September to 75 in February, and there were only occasional extrasystoles by the end of the treatment. The general subjective symptoms were improved to such a degree that the patient was able to resume his work. The authors believe in the curative action of atropine in extrasystoles and think that the atropine test in cardiac patients, though not of such absolute value as in persons with a normal heart, helps to ascertain the true condition of the vegetative nervous system; it should be made with care, however, on account of the possible toxic action of atropine on the myocardium.

Bulletins et Mém. de la Soc. Nat. de Chirurgie, Paris

54: 1399-1455 (Dec. 22) 1928. Partial Index

Treatment of Cancer of Tongue. Moure.—p. 1400.
Supra-Acetabular Bone. A. Mouchet and C. Reederer.—p. 1403.
Results of Posterior Radicotomy and Ramisection in Little's Disease. R. Leriche.—p. 1406.
Postoperative Use of Hypertonic Sodium Chloride Solution. A. Michel.—p. 1415.
*Accidents Following Intra-Uterine Injections of Iodized Oil. Sicard and Solal.—p. 1423.
Immediate Results of an Operation for Syringomyelia. A. Zeno and O. Cames.—p. 1437.
Ulcers of Legs in Splenomegaly. P. Lombard and Nanta.—p. 1440.
Mild Forms of Vertebral Osteomyelitis. R. le Fort and P. Ingelrans.—p. 1445.

Accidents Following Intra-Uterine Injections of Iodized Oil.—Sicard and Solal report a case of pelvic suppuration after an intra-uterine injection of iodized oil in a healthy woman, aged 30, who consulted a physician for sterility. Gynecologic examination was negative. Iodized oil was injected, with all necessary precautions, two days before the time of menstruation. The uterus and tubes were apparently normal. Three days after the injection a swelling of the anterior fornix of the vagina was discovered, and eight days later the woman developed a severe pelvic suppuration, with high fever and bad general condition, which kept her bedridden for two months. The authors think that physicians are abusing the use of iodized oil. Its use should be confined to the diagnosis of sterility, and in all cases the patient should be told about the possible danger of complications.

Gazette Hebdomadaire des Sciences Méd. de Bordeaux

49: 769-784 (Dec.) 1928

*Acrodynia in Adult. H. Verger and P. Delmas-Marsalet.—p. 771.
Diagnosis of Tuberculosis of Bronchial Lymph Nodes in Children. F. Piéchaud and P. Lamothe.—p. 773.

Acrodynia in Adult.—Verger and Delmas-Marsalet report a case of nonepidemic acrodynia in a woman, aged 39. She had rhythmic muscular contractions in the legs, paresthesia and severe pains in the palms and in the soles, accompanied by redness and local increase of temperature, hyperalgesia, and slight decrease of the thermic sensations in the same regions. All tendon reflexes were absent. The superficial skin reflexes and the pupillary reflexes were normal; the epinephrine, pilocarpine, atropine and Wassermann tests were negative. The patient did not use ergot, arsenicals, rye or corn. The authors consider this case of acrodynia in an adult as an intermediary form between epidemic acrodynia and the acrodynia of infants. It differs from the latter form only by the absence of mental disturbances; from the former, by the absence of conjunctival and pigmentary lesions and by its sporadicity. On the basis of the pathologic changes in the anterior columns of the spinal cord in this disease, the authors advance the hypothesis of a cerebrospinal origin of acrodynia.

Gynécologie et Obstétrique, Paris

18: 369-448 (Nov.) 1928

Treatment of Late Postpartum Hemorrhages by Hysterectomy. A. Couvelaire, L. Portes and L. Digonnet.—p. 370.
*Induced Premature Labor in Contracted Pelvis. S. A. Gammeltoft.—p. 387.
*Induced Premature Labor in Dystocia. E. Hauch.—p. 392.
*Induced Premature Labor in Contracted Pelvis. V. Esmann.—p. 401.
Use of Iodized Oil in Gynecology. M. van der Elst and E. Gautot.—p. 405.
Treatment of Sacrolumbar Pains. P. Rullé.—p. 425.

Results of Induction of Premature Labor in Women with Contracted Pelves.—Gammeltoft induced premature labor in sixty-nine cases of contracted pelvis by rupturing the membranes after dilation of the cervix with Bossi's dilator. If labor did not start in from four to six hours 0.2 cc. of solution of pituitary was given hypodermically. He selected women in whom the diagonal conjugate was not more than 10 cm. and intervened when he could not easily force the fetal head into the pelvis by pressure exerted through the abdominal wall. The results were a maternal mortality of 0 and an infant mortality of 5.9 per cent.

Induced Premature Labor in Dystocia.—Hauch, using the same method for rupturing the membranes after cervical dilation as Gammeltoft, induced premature labor in fifty-seven

cases of contracted pelvis, with somewhat better results. The maternal mortality was 0; the infant mortality, 3.7 per cent.

Induced Premature Labor in Contracted Pelvis.—Esmann induced premature labor in fifty-five cases of justo minor pelvis from the thirty-sixth to the thirty-seventh week of pregnancy by introducing into the cervical canal from two to four laminaria tents, after dilating the cervix. In from eighteen to twenty-four hours he withdrew the laminaria, dilated the cervix more and ruptured the membranes. The maternal mortality was 0; the infant mortality, five dead and fifty living babies.

Marseille-Médical, Marseilles

65: 797-824 (Dec. 25) 1928

Cardiospasm and Dilatation of Esophagus. C. de Luna.—p. 797.
*Relationship Between Lymphatic Constitution and Chronic Colitis. P. Giraud and J. Turriès.—p. 805.
Periduodenitis (Clinical Study). R. Sarles.—p. 812.

Relationship Between Lymphatic Constitution and Chronic Colitis.—Giraud and Turriès noted a frequent occurrence of chronic colitis in persons whose lymphatic tissues had definite predisposition to infection and hypertrophy ("lymphatic constitution"). Usually these cases of chronic colitis are observed in pale children, aged from 5 to 15, with polyadenopathies, hypertrophied tonsils and adenoids, and frequent attacks of rhinitis and blepharitis. The disease begins as an inflammation of the intestinal lymph follicles; then the mucous membrane as a whole becomes involved, and a chronic or recurrent mucous or mucomembranous colitis develops. These cases are refractory to local and dietetic treatment but respond promptly to general treatment, such as tonics, heliotherapy, actinotherapy, hydrotherapy and climatotherapy, without intestinal medication or strict diet.

Presse Médicale, Paris

37: 49-64 (Jan. 12) 1929

*Surgical Complications of Dengue. T. Papadopoulo, M. Yoel and A. Hadjigeorges.—p. 49.
*Modern Treatment of Nasal Suppurations. Grain.—p. 51.

Surgical Complications of Dengue.—Papadopoulo et al. noted a great number of surgical complications during the 1928 epidemic of dengue in Greece. In eighty cases they observed eleven peritonsillar abscesses (two deaths); seven carbuncles; twenty cases of parotitis; eleven cases of adenitis; numerous cases of onychitis, abscesses and phlegmons of the extremities and of the skull; one perinephritic abscess; one perirectal abscess and abscesses of the chest wall; three cases of osteomyelitis; one case of pyelitis; three cases of gangrenous hemorrhages, and one case each of appendicitis and phlebitis.

Modern Treatment of Nasal Suppurations.—Grain recommends local and general vaccinotherapy in the treatment of nasal suppuration. He uses polyvalent antivirus (if possible autovaccines) for local applications, which should always be applied bilaterally (even in unilateral lesions), continued until the complete disappearance of the suppuration and combined with the same kind of treatment of the rhinopharynx. General vaccinotherapy (with autovaccines or polyvalent stock vaccines) is used simultaneously with the local treatment in subacute or chronic cases, but in acute suppurations only after an amelioration of the local inflammatory process. The treatment is borne well, and gives prompt and very good results in cases of acute and chronic suppurations of the nasal fossa, sinusitis and ethmoiditis, even of several years' duration, in which the mucous membrane is not completely destroyed or degenerated to such a degree that it is no longer able to react to the treatment. In the latter cases surgical intervention is indicated. Antiseptic applications are condemned.

Revue d'Orthopédie, etc., Paris

15: 473-764 (Nov.) 1928

Fracture of Lateral Humeral Epicondyle in Children. R. Massart and Caboaut.—p. 475.
*Fracture of Patella Complicated by Ossification of Deep Prepatellar Bursa. R. Redi.—p. 497.
Painful Flatfoot Cured by Operation. A. Trèves.—p. 505.
Functional Adaptation in Old Dislocations of Humerus. J. J. Dessaint.—p. 508.
Simple Pathologic Dislocations of Femur. R. le Fort.—p. 514.
Surgical Treatment of Flatfoot. E. Allenbach.—p. 650.
Bone Mycosis Caused by Madurella. M. Meyer.—p. 696.
Surgical Intervention in Case of Fusion of Fifth Lumbar Vertebra with Sacrum. M. Delchef.—p. 700.
Late Recurrent Dislocation of Femur in Case of Reduced Congenital Dislocation of Femur, with Anteverted Neck. M. Delchef.—p. 703.

Fracture of Patella Complicated by Ossification of Deep Prepatellar Bursa.—Redi reports the case of an otherwise healthy woman, aged 31, who was operated on for a prepatellar tumor of the left knee, three years after she had been treated for a fracture of the patella. The tumor proved to be a calcified and ossified deep prepatellar bursa. Because the calcification of bursae is usually considered a modification of chronic bursitis, Redi thinks that this case may be cited as an example of bursal ossification of traumatic origin.

Gazzetta degli Ospedali e delle Cliniche, Milan

49: 1505-1536 (Nov. 25) 1928

Evolution of Papilloma of Urinary Bladder. F. Bindi.—p. 1505.
*Reanimation of Human Heart by Intracardiac Injection of Epinephrine. E. Truzzi.—p. 1507.
Hemiplegia Due to Softening of Brain. L. Ramond.—p. 1511.

Reanimation of Human Heart by Intracardiac Injection of Epinephrine.—Truzzi is induced to report this case not because it reveals new facts pertaining to the subject but because of the interest that attaches to the success obtained, which was rapid, permanent and free from disagreeable sequels, which is true of very few cases described in the literature. A farmer, aged 70, was admitted to the hospital, June 22, 1928, with a diagnosis of right strangulated crural hernia. An immediate operation was performed. After about fifteen minutes from the beginning of the operation, a second injection of caffeine was given, as the pulse had become weak. Respiration was no longer regular and the face had become pale. Nevertheless, after an injection of oil with camphor and inhalation of oxygen, the operation was continued. At the end of the intervention, the general condition of the patient was worse. The pulse was thready and had become more rapid. It was scarcely perceptible at the wrist but could still be taken at the carotid artery. Oxygen was administered while the wound was being bandaged. An injection of caffeine was given, and artificial respiration was applied. The patient took a few deep breaths, and then collapsed again. The pulse could not be perceived now at the carotid, and the heart beats were weak and indistinct. Respiration was superficial, with certain phases of apnea; the extremities were cold and cyanotic, and the face had a preagonal appearance. A second injection of oil with camphor was given, followed by an injection of 0.001 Gm. of strychnine, but to no avail—the patient grew steadily worse. In these vain attempts at resuscitation, more than half an hour had elapsed. The heart was again auscultated. The heart beats were imperceptible; respiration had ceased; the face had a cadaveric appearance; the eyes were glassy, and the pupils were dilated; the condition was one of genuine syncope. An intracardiac injection of epinephrine was given. With a long needle, a puncture about 10 cm. deep was made in the fourth intercostal space, about 3 cm. from the left sternal border. When the operator had the sensation of having penetrated the heart muscle, he injected 2 cc. of epinephrine hydrochloride solution. Within ten seconds, weak and indistinct radial pulse beats were noted. Suddenly, the patient drew a deep breath, roused himself as from a lethargy, and rolled his eyes. The pulse gradually became more distinct, stronger and more rhythmic. The face regained its normal color, and life returned. The patient tried to sit up in bed; he began to talk, and recognized the persons standing about. He was given a little coffee, which he drank, holding the cup without assistance. Further injections and artificial respiration were not needed. The patient was dismissed, July 2, 1928, perfectly cured.

Riforma Medica, Naples

44: 1616-1645 (Dec. 10) 1928

Pathogenesis of Icterogenic Spirochetosis. G. Sanarelli.—p. 1617.
*Thiemia in Human and Experimental Diabetes. R. Paolini and P. Cocuzza.—p. 1622.
Etiology and Pathology of Symmetrical Multiple Lipomatosis. A. Mirolli.—p. 1624.

Thiemia (Excess of Sulphur in Blood) in Human and Experimental Diabetes.—In their experiments, Paolini and Cocuzza produced diabetes in dogs by performing partial pan-

createctomy, leaving about one tenth of the gland. They also investigated clinically four cases of severe diabetes. In one patient the glycosuria varied between 20 and 30 per thousand, with a glycemia of 2.5 to 3 per thousand. The patients were on a mixed diet. The authors conclude that in experimental and human diabetes, the sulphur content of the blood is much altered, corresponding to the changes in the general condition of the patient. In experimental diabetes there is an increase in oxidized sulphur and a notable increase in the total sulphur, with a considerable increase of the neutral sulphur. In human diabetes there is a decrease of oxidized sulphur and a considerable increase of the neutral sulphur. The total sulphur remains within almost normal limits.

44: 1648-1681 (Dec. 17) 1928

Surgical Treatment of Elephantiasis of Legs. L. de Gaetano.—p. 1649.
*Treatment of Leprosy with Various Forms of Tellurium. R. Stanziale. —p. 1652.
Roentgenologic Study of Demineralization of Bones in Pulmonary Tuberculosis. A. Vallebona.—p. 1656.
*Effect of Extract from Keith-Flack Node on Myocarditis. D. Maestrini. —p. 1662.

Treatment of Leprosy with Tellurium.—Stanziale has used three different preparations of tellurium: tellurium elements, 10 per cent, in a 5 per cent dextrose solution; tellurium iodide, in a 10 per cent oil suspension, and quinine and tellurium iodide, 5 per cent, suspended in oil. Four of the author's five patients had tubercular-anesthetic leprosy; one had macular leprosy. Daily injections of from 1 to 2 cc. of tellurium for five or eight days (depending on the local and general reaction) were given up to at least ten injections. The local reaction was always severe. Generally, with tellurium element there was hyperthermy of about 39 C., which gradually disappeared. The four patients with tubercular-anesthetic leprosy had a strongly positive Wassermann reaction. The patient with macular leprosy had a negative Wassermann reaction. After treatment, the anesthesia had diminished to hypoanesthesia in some spots. The treatment produced whitening of the skin, which was most marked in the eruptive spots. The drug did not affect the kidney. An effect of the tellurium on the parasite was not observed at first but was apparent later.

Effect of Extract from Keith-Flack Node on Myocarditis.—Maestrini says that it is possible to extract from the Keith and Flack node of the heart of the ox a substance which appears to have a special action on the heart of patients suffering from myocarditis. The action of this extract is exhibited in a positive inotropic effect and in a eurhythmic effect. The chronotropism was modified by this extract, though not as much as was the inotropism. The general condition of the patients improved during the period in which the extract was given. The author administered the extract in the form of pills, each containing 0.1 Gm. From fourteen to twenty-eight pills were given each twenty-four hours. The author's patient received eighteen pills in twenty-four hours. She improved. When the extract was discontinued, changes of rhythm were noted. She received twenty-five pills in the next twenty-four hours. Eight hours after taking the first pill she began to improve. This time the improvement continued to complete recovery.

Beiträge zur klinischen Chirurgie, Berlin

145: 1-190 (Nov. 23) 1928

Continued Drainage of Cerebrospinal Fluid in Hydrocephalus and Results of Healing of Implants. B. Heile.—p. 1.
So-Called Genuine Diverticulum of Bladder. E. Lex.—p. 31.
*Diagnostic Value of Classic Symptoms of Kidney Tumors. A. Schmidt. —p. 48.
Disease of Sesamoid Bone of First Metatarsal. H. Schütz.—p. 65.
*Experimental and Clinical Studies of Rectal Narcosis, Especially Drop Ether-Oil Narcosis. P. F. Nigst.—p. 75.
Postoperative Motor Disturbances of Stomach. F. Reischauer.—p. 101.
C'tn.
Congenital Kinking of Gallbladder Fundus. H. Bronner.—p. 132.
*Preparation of Antiseptic Suture and Bandage Material by Impregnation with Copper Salts. G. von Linden.—p. 143.
*Straightening Knock Knees (Genu Valgum) by Stimulation of Epiphyseal Cartilage. K. Reschke.—p. 163.
Roentgen Treatment of Inoperative Carcinoma. O. Kingreen.—p. 169.
Pancreas Apoplexy an Indication for Surgical Intervention. M. Krabbel. —p. 177.
*Two Interesting Cases of Carcinoma of Small Bowel. S. R. von Linhardt. —p. 182.

Diagnostic Value of Classic Symptoms of Kidney Tumors.—The material analyzed by Schmidt comprised three nonmalignant and forty-five malignant tumors of the kidney, an incidence of 0.087 per cent of all cases admitted to the clinic —one of the former to 1,218 patients and one of the latter to 17,058 patients. The tumor incidence among all cases of kidney disease was 6.14 per cent. The nonmalignant tumors were a papillary adenoma, a papillary cystadenoma and a papilloma of the kidney pelvis. Among the malignant tumors were twenty-nine hypernephromas, six carcinomas of the kidney, one papillary carcinoma of the kidney pelvis, three sarcomas, one suprarenal sarcoma in an adult and five mixed tumors in children. The classic symptoms of this condition were of no value in making an early diagnosis. Hematuria was present in 83 per cent, and 76.7 per cent of the patients complained of pain. A tumor was seldom palpable, although 10 per cent of the patients had felt one themselves. Blood in the urine and pain in the region of the spinal column or in the loin should, the author says, call for a careful and thorough urologic and roentgen examination, the examiner having in mind a kidney tumor. Gastro-intestinal disturbances, vomiting, loss of appetite, constipation alternating with diarrhea, alone or in combination, were present in 13 per cent of the cases. Colicky pains were present in 90 per cent. In 11 per cent, pain referable to the bladder, urethra or testes was a marked symptom. One patient complained of shortness of breath. The conclusion is reached that the indefiniteness of the symptoms is of value in that it should direct attention to the kidney as possibly being the seat of a tumor.

Rectal Anesthesia.—In forty-six rabbits anesthetized rectally by the ether-oil drip method, Nigst was able to produce anesthesia with one third less anesthetic and without causing any harm to the animal. He says that the drip method makes it possible to control the anesthesia absolutely as to the depth and the amount of anesthetic used. He would use it, however, only in those cases in which the use of a face mask for general anesthesia would interfere with the operative procedure, and in nervous persons and children. It is not recommended as a substitute for general anesthesia in the usual run of cases.

Antiseptic Value of Catgut, Silk and Bandage Material Impregnated with Copper Salts.—Von Linden has experimented with the use of solutions of various copper salts (kind and strength not stated) as a means of preparing perfectly sterile catgut, silk and bandage material (gauze). She found that it is far superior to any other method of preparation in the degree of antisepsis and also in its keeping qualities. The catgut, for instance, is placed in the copper solution and left there until it has become a uniform green or blue, depending on the salt of copper used. The time required for attaining this result depends on the strength of the solution. Catgut prepared in this manner may be left exposed to the air indefinitely without losing any of its antiseptic quality. It keeps indefinitely when put up in packages and it never interferes with the strength of the suture material nor does it injure the tissues. Therefore, wound healing is not hindered at all. Catgut prepared in this manner is said to be far superior to cumol catgut or iodine catgut. This work was checked carefully by bacteriologic examinations.

Treatment of Knock Knee.—Reschke reports further on the results that he obtained from the use of ivory pegs driven into bone and directed toward the epiphyseal cartilage in the treatment of knock knee. The purpose is to stimulate the epiphysis to increased growth. Among eight cases treated in this manner only one failed to show a good result. The patient was 16 years of age and had a high degree of genu valgum. The youngest patient was 12; most of the patients were between 16 and 18 years of age. The method is said not to be applicable in young patients. In each case three or four pegs are driven into the outer side of the femur, just above the epiphyseal cartilage, and directed downward toward the cartilage, and similarly into the tibia. The pegs must not touch the cartilage, nor even lie too close to it. The outer ends must not be flush with the bone, as a little protrusion is a powerful stimulus to periosteal growth.

Carcinoma of Small Intestine.—Von Linhardt relates the case of a man, aged 50, with a negative personal and family

history, who suddenly became jaundiced and complained of pain to the left of the umbilicus, which eventually became colicky. A loud gurgling noise marked the termination of each colic. The feces and urine were normal. The patient was well nourished, had not lost any weight and had a good appetite. A laparotomy was performed. The small bowel was distended and filled with fluid as far as about 36 inches from the ileocecal valve. At this point it resumed its normal form. Here a tumor, the size of a fist, was discovered. It was excised, together with about 50 cm. of the intestine, and an end to side anastomosis was made. The tumor proved to be a carcinoma globocellulare partim diffusum partim alveolare. The second patient was 62 years of age. He had been entirely well previously. The first symptom was a stomachache, which was soon followed by vomiting and then severe pain in the umbilical region and the same gurgling sound as in the first case. The abdomen was very tympanitic and intestinal peristalsis was noted. Palpation was negative. The urine contained indican. Operation was performed. The small intestine had the same appearance as in the first case and an adenocarcinoma was found in the same locality as the tumor in case 1. Resection and anastomosis were made. The patient made an uneventful recovery; however, five months later he returned with a recurrence of the symptoms. Examination revealed numerous metastases throughout the abdomen and in the liver.

Deutsche medizinische Wochenschrift, Berlin

55: 45-88 (Jan. 11) 1929

Treatment of Amebic and Bacillary Dysentery and Their Sequelae with Iodo-Oxybenzene Pyridine Sulphonate. P. Mühlens.—p. 49.
*New Methods of Diphtheria Prophylaxis. E. Loewenstein.—p. 53.
New Combination Serum for Treatment of Diphtheria and Scarlet Fever. Becker.—p. 55.
Clinical Experience with Chemotherapy in Otology and Diseases of Upper Air Passages. O. Fleischmann.—p. 58. C'en.
Tuberculosis of Apex of Lungs in Relation to Early Infiltrations. Unverricht.—p. 60.
Tribromethyl Alcohol Narcosis in Psychiatry. G. Blume.—p. 61.
*Influence of Quartz Lamp Irradiation on Secretion of Milk in Nursing Mothers. Drossel.—p. 62.
*Epidemic of Glandular Swellings at Angle of Jaw in Influenza and Their Treatment. A. Plate.—p. 62.
Calcification of Organs Under Influence of Vitamin D. C. R. H. Rabl.—p. 63.
Cause and Prevention of Overheating in Diathermy Treatments. O. Dieterich.—p. 64.

New Methods of Diphtheria Prophylaxis.—Loewenstein points out that the different serums and methods of protective inoculation for diphtheria have in some instances either caused serious complications and fatalities or not proved effective. Therefore, it has been his aim to prepare an antigen and to find a method of applying it that would combine harmlessness with effectiveness and ease of administration. After extensive research he finally succeeded in preparing the desired serum. A diphtheria culture is mixed with formaldehyde in the proportion 4 : 1,000. It is then placed in the incubator for three weeks. Through this the preparation loses its toxicity while retaining its prophylactic qualities. Subcutaneous injections with this antigen, however, did not bring the desired results. Loewenstein therefore substituted inunction for injection. He employed his method in a children's clinic. After the children had undergone the Schick test, those with a positive reaction were given inunctions with the antigen. Neither local nor general reactions were observed. Eight per cent became immune after the first treatment. Following repeated treatments 72 per cent were immunized. In 28 per cent of the cases this method was not effective. Loewenstein emphasizes that these treatments are absolutely harmless and that they are easily applied. Since fatalities from diphtheria reach their peak in children between the ages of 4 and 5 years, the author recommends that this method be used soon after the child has reached the age of 1 year. The immunity becomes effective from fifty to sixty days after the treatment and reaches its height in the fourth month.

Influence of Quartz Lamp Irradiation on Quantity of Milk in Nursing Mothers.—The presumption that quartz lamp irradiation increases the quantity of milk in nursing mothers was tested by Drossel on fifteen women. The treatments were given as follows: Five minute irradiations, at a distance of 80 cm., were gradually increased to from seven to eight minutes and later to twenty minutes. At first the treatments were given every other day; later only once or twice a week. The total number of irradiations during the first three or four weeks were usually twelve or fourteen. Later the women were given one or two treatments a week, each irradiation lasting thirty minutes. The author observed positive results only in those cases in which the treatments were started during the first week following the birth of the child. He doubts, however, that this is the effect of the irradiation, because during this time the quantity of milk normally increases. In four instances he even noticed a decrease. No extraordinary increase was observed in any of the cases. Drossel concludes that his experience does not substantiate the claims made by others that quartz lamp irradiation increases the secretion of milk in nursing mothers.

Epidemic of Glandular Swellings at Angle of Jaw in Influenza.—Plate observed that of twenty children, aged from 1 to 2 years, eleven contracted a "glandular influenza." The patients had high fever and the tonsils were reddish but not coated. In some apathy and loss of appetite were observed. The high fever usually lasted from two to three days. For the three or four days following, the temperature dropped. Then the fever increased again and swellings of the glands at the angle of the jaw were observed. In some patients they were found on both sides; in others they appeared only on one side. A puncture made in a child, aged 1½ years, yielded thick pus. Microscopic examination revealed streptococci. Whether streptococci are always present in this disease could not be ascertained. On the supposition that they might be present in all cases, Plate applied an antiseptic to the tonsils twice a day and to the pharyngeal region in all twenty children. Following this treatment, no other cases occurred. The author also points out that hot applications might be a valuable aid in the treatment of this "glandular influenza."

Deutsche Zeitschrift für Chirurgie, Leipzig

213: 147-302 (Jan.) 1929

*Diagnosis and Surgical Treatment of Malignant Tumors of Papilla of Vater and Head of Pancreas. G. Dencks.—p. 147.
*Spontaneous Hematoma of Abdominal Wall. G. Dencks.—p. 159.
*Alarming Abdominal Symptoms in Internal Diseases. R. Ehrmann and H. Taterka.—p. 170.
Surgical Treatment of Pulmonary Tuberculosis of Children. I. Zadek and A. Sonnenfeld.—p. 175.
Intrathoracic Ciliated Epithelial Cysts. H. W. E. Ehlers.—p. 189.
Interfereometry and Internal Secretion. M. Landsberg.—p. 198.
Tribromethyl Alcohol Narcosis. E. Hahn.—p. 202.
Disinfection of Hands with Vasoform Powder. H. E. Süssbach.—p. 211.
Bone Cysts. G. Thiemke.—p. 217.
Congenital Synostosis Between Radius and Ulna. C. A. Boeckh.—p. 225.
*Traumatic Dislocation of Symphysis Pubis. E. Timm.—p. 231.
*Late Results of Perthes' Disease. Mühlbradt.—p. 243.
Pathology of Tumors of Omentum. K. Strauss.—p. 254.
Perforated Gastric and Duodenal Ulcers. H. Wolff.—p. 262.
Fatal Gastric Hemorrhage Following Talma's Operation. H. Egel.—p. 270.
*Oxyuris in Appendix. H. W. E. Ehlers.—p. 275.
Differential Diagnosis of Splenomegaly. H. W. E. Ehlers.—p. 280.
Spontaneous Rupture of Spleen. J. Schachnowitz.—p. 283.
Bilateral Kidney and Ureter Stones. E. Renter.—p. 289.
Roentgen Treatment of Salivary Fistula by Temporary Exclusion of Parotid. C. Wittkowsky.—p. 298.

Malignant Tumors of Papilla of Vater.—Dencks reports five cases, two of sarcoma and three of carcinoma. The two patients with sarcoma were 31 and 34 years of age, respectively; the patients with carcinoma were between 48 and 61. In the first case, a spindle cell sarcoma had originated in the duodenal mucosa; in the second case a lymphosarcoma encircled the papilla and was firmly ingrown into the head of the pancreas. In this case, metastases were also present. In the cases of carcinoma, the tumor originated in the region of the papilla in two cases, and in one case from the head of the pancreas. A secondary growth was present in the gallbladder. Metastases were present in only one case. Early metastases were not observed in any case. Gallstones were not present in any case. The symptoms were fairly characteristic in these cases. The patients complained of pressure and radiating pains in the epigastric region, usually noted only after eating. Two patients complained of watery stools. None had any appetite. All were jaundiced. This was always an early symptom, but not

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the first. In only one case was the icterus intense from the beginning, remaining so up to the time of operation. In the remaining four cases there were remissions. The feces always contained occult blood. In three cases there was marked gastric subacidity; in two cases the acidity was slightly increased. All the patients had lost considerable weight, but it was noteworthy that they all gained in weight during their stay in bed with proper feeding. The author failed to note that, as stated by other observers, very small tumors of the papilla caused severe symptoms. In his case the tumor was at least as large as a chestnut before any symptoms were manifest. Increase in temperature was never noted, nor were severe infections of the biliary passages present. Roentgen examination was usually of great diagnostic value. The liver and gallbladder were always enlarged considerably.

Spontaneous Hematoma of Abdominal Wall.—In the case reported by Dencks, the epigastric artery had ruptured; the rectus muscle was intact. The patient was 65 years of age. The author is of the opinion that these hematomas are definite clinical entities in the aged, and especially in women. Men are never affected. Usually the bleeding is the result of a tear of the rectus muscle; occasionally the epigastric artery ruptures. Arteriosclerosis is not an essential cause.

Cause of Acute Abdominal Symptoms.—Ehrmann and Taterka assert that symptoms of severe peritoneal irritation and suggestive ileus symptoms, which might lead one to suspect a surgical condition, may be caused by a diabetic coma (pancrealgia) grip, lead poisoning and kidney or ureter colic. Therefore, care in differentiation must be observed. He cites a case in which renal calculus gave rise to symptoms which had been mistaken for cholecystitis and consequent pancreatitis.

Dislocation of Symphysis Pubis.—Timm relates two cases in which, as the result of automobile accidents, a severe dislocation of the symphysis pubis occurred. He operated immediately in the first case. The bones were replaced and secured with wire sutures. In the second case he attempted to secure reposition by means of a plaster cast and Buck's extension on one leg, but failed. Then he operated, made a reposition and resorted to nail extension to maintain it. The final result was perfect in both cases. He advises that, if possible, conservative treatment should be resorted to because of the danger of postoperative infection which is so apt to follow open operations on the symphysis, but not to delay operation if other measures fail.

Late Results of Perthes' Disease.—Mühlbradt had the opportunity to examine two patients with Perthes' disease seventeen and eighteen years, respectively, after they had been seen elsewhere and diagnosed as having spontaneous fractures of the neck of the femur. In both cases there was considerable deformity of the upper end of the femur, with extensive arthritic changes. He feels that there are three definite stages of this disease: destruction, regeneration, and changes in the joint cartilage.

Oxyuris in Appendix.—In the case cited by Ehlers, an oxyuris had embedded itself in the wall of the appendix, probably gaining entrance through a defect in the mucosa. It burrowed its way through the layers of the appendical wall, leading to the resorption of the intestinal contents, which, in turn, set up a high grade peritonitis. Although the symptoms were not characteristic of appendicitis, this condition was suspected. The appendix was removed and the patient recovered.

Jahrbuch für Kinderheilkunde, Berlin

122: 127-252 (Dec.) 1928

Conditional and Unconditional Salivary Reflexes. N. Krasnogorski.—p. 127.
Inhibition of Conditional Reflexes. A. Juschtschenko.—p. 132.
Effect of Nutrition on Composition of Adipose Tissue. K. Mosse and C. Brahm.—p. 151.
Metabolism of Children After Parenteral Administration of Protein: During Fever. O. Beck.—p. 168.
Pathogenesis of Scarlatinal Nephritis. B. Steiner.—p. 181.
*Sedimentation Speed of Erythrocytes in Acute Infectious Diseases. F. von Rohrböck.—p. 192.
*Neuroblastoma of Suprarenal with Metastases in Liver. S. M. C. van Veen.—p. 214.
Diet of Infants Aged from Nine Months to Two Years. J. Hoffmann-Mendelewa.—p. 221.

Sedimentation Speed of Erythrocytes in Acute Infectious Diseases.—Von Rohrböck determined the erythrocyte sedimentation speed in seventy-five cases of diphtheria, scarlet fever and measles, using a specially constructed syringe, according to the original method of Westengren. In cases of uncomplicated diphtheria and scarlet fever, the higher value observed in the initial fever soon returned to normal again. Complications accompanying diphtheria cause considerable fluctuations; in complicated cases of scarlet fever the acceleration is relatively slight; in both diseases, however, the higher values may be maintained for several weeks. The sudden rise following the return to normal always indicates a complication. In uncomplicated measles the values are low, but if the disease is accompanied by tuberculosis the sedimentation speed is increased.

Neuroblastoma of Suprarenal with Metastases in Liver of Infant, Aged Eighteen Days.—Van Veen reports a case of neuroblastoma of one suprarenal and marked enlargement of the liver due to metastases. There are two specific types, the Pepper and the Hutchison. In the former, the primary tumor is generally rather small, and the liver metastases are voluminous and are sometimes followed by metastases in other viscera; in the second type, the primary tumor is often larger than in the Pepper type, the growth is slower and metastases develop in the flat bones, especially those of the skull. Metastases may be found in other bones, too, as well as in the lymphatic system. The case described belongs to the Pepper group.

Klinische Wochenschrift, Berlin

7: 2469-2492 (Dec. 23) 1928

Melanotic Pigments. R. L. Mayer.—p. 2471.
Pathogenesis of Experimental Syphilis of Central Nervous System. I. L. Kritschewski and E. S. Heronimus.—p. 2472.
*Diagnosis of Typhoid in Children. N. Wundt.—p. 2474.
Postmortem Changes in Parenchymatous Organs. H. Meltzer.—p. 2477.
Relationship Between Exophthalmic Goiter and Basal Ganglions. W. Riese.—p. 2479.
Quantitative Evaluation of Turbidity of Urine in Diseases of Urinary Tract. H. Steininger and W. Heuer.—p. 2480.
Genesis of Leukocytes of Inflammation. W. von Möllendorff.—p. 2481.
*Liver Diet in Scurvy. H. Aron, H. Hirsch-Kauffmann and E. Schädrich.—p. 2484.

Diagnosis of Typhoid in Children.—The symptomatology of typhoid in infants and children is, according to Wundt, quite different from that in adults. Of the forty cases which she observed, only a small percentage showed the typical symptoms of typhoid. The enlarged spleen was absent in most cases. Demonstration of typhoid bacilli in the blood, feces and urine was possible in only about one half of the cases. The diagnosis was based on the following symptoms: fever, with leukocytopenia, and a rising agglutination titer. They were observed in all of the cases reported.

Liver Diet in Scurvy.—In the belief that a deficiency in vitamin C is the principal cause of scurvy, and that the therapeutic value of a liver diet lies in its richness in vitamin C, Aron et al. experimented on guinea-pigs. The animals were kept on a scurvy-inducing diet. At the same time they were given fresh, aqueous liver extract. Several control animals received the same diet but no liver extract. The result was that the animals which were given the liver extract remained free from scurvy for four months, while the control animals died of scurvy after the third or fourth week.

Monatsschrift f. Geburtshülfe u. Gynäkologie, Berlin

80: 243-402 (Nov.) 1928

*Lead Treatment of Malignant Tumors. M. M. Datnow.—p. 243.
Protracted Pregnancy and Late Appearance of Morning Vomiting. H. Füth.—p. 260.
Treatment of Febrile Cases of Abortion. M. Mgalobeli.—p. 265.
Tribromethanol Anesthesia. W. Beck.—p. 272.
Mechanism of Evolution of Cancer. L. Weill.—p. 278.
Lateral Hematocolpos. H. H. Schmid.—p. 283.
Metastatic Gastro-Enterogenous Cancer of Ovary. F. Isbruch.—p. 289.
*Prognosis in Intracranial Birth Injuries. H. Naujoks.—p. 297.
Etiology and Prognosis of Congenital Genu Recurvatum in the New-Born. E. Henrard.—p. 317.

Lead Treatment of Malignant Tumors.—Datnow reports the results of lead therapy in 227 patients with cancer; nine of these patients would not consent to intensive treatment but were able to go about as usual; in ten the growth was stopped completely, and thirty-one were discharged as cured. This

treatment was used only in nonoperable cases of cancer, and was preceded if possible by excision of the largest part of the tumor, and examination of the urine, the blood and the functions of the liver. The same examinations were made after each injection of lead, which was used in colloidal form. Roentgen or radium treatment may be combined with the lead treatment. The author finds that the therapeutic effect of lead is more certain and differs from the action of other metals because it inhibits the cellular growth but does not destroy the cells.

Prognosis in Intracranial Birth Injuries.—On the basis of his own observations and of statistical data from various sources, Naujoks concludes that after children have lived through the first disturbances caused by intracranial hemorrhages, some of them never present any physical or psychic disturbances; some die of the direct or indirect consequences of intracranial hemorrhages (convulsions), and some develop nervous stereotypy or speech disturbances. Little's disease and psychic disturbances are never observed following intracranial hemorrhages.

Wiener klinische Wochenschrift, Vienna

41: 1737-1768 (Dec. 20) 1928

Schilling's Erythrocyte Inclusions in Pernicious Anemia. E. Lauda and E. Flaum.—p. 1737.
*Treatment of Pneumonia in Children. F. Basch.—p. 1738.
Chronic Infectious Anemia. J. T. Peters.—p. 1741.
Roentgenotherapy of Skin Diseases. H. Fuhs.—p. 1743.
*Diagnosis and Treatment of Tuberculosis in the Aged. H. Schlesinger. —p. 1751.
Indications for Cesarean Section. L. Kraul.—p. 1753.

Treatment of Pneumonia in Children.—If the child shows restlessness, insomnia and panting respiration, but neither cyanosis nor collapse phenomena, Basch regards plenty of fresh, cool air as of great importance in the treatment. The bed should be moved to the open window or an open porch. An infant, if warmly dressed, may be carried around in the garden. The fresh air has a quieting influence, the circulation improves and the patient is able to sleep. The use of oxygen inhalations is also very helpful. Cardiac stimulants should be avoided in these cases. When the child is weak and pale, with shallow respiration and enfeebled heart action followed by cyanosis, it is advisable to administer cardiac stimulants. Digitalis should be avoided in the beginning. To strengthen the heart muscle, intravenous injections of dextrose solution are very effective. If the child is suffering from dyspnea and if the heart action becomes very weak, oxygen and cardiac stimulants are only temporarily effective. For such cases the author advises hot baths for older children or mustard applications for infants. If these are not effective, venesection should be done. Cachexia frequently follows resolution of the pneumonia. In such cases Basch advised blood transfusions. Quartz lamp treatments are effective for the subacute stages of pneumonia. Of great importance also is the nutrition of the child. For infants an antidyspeptic diet should be prescribed; the author gives butter milk or albumin milk. In case of alimentary disturbances, nutrient sugar solutions should be given. The diet of older children should include milk, eggs and sugar. To satisfy the craving for fluids, sufficient quantities of water, tea and fruit juices should be given. Care should be taken that the air in the sickroom has a sufficient content of moisture and that the patient is always kept in a half sitting position.

Diagnosis and Treatment of Tuberculosis in the Aged.—Schlesinger asserts that the aged are more often affected with tuberculosis than is usually believed to be the case. An erroneous diagnosis is due to the fact that many of the clinical symptoms of this disease are frequently entirely absent in older persons. Auscultation and percussion usually fail as aids to diagnosis because the thorax has become rigid. Râles are also very rarely observed. Night sweats, which are characteristic of pulmonary tuberculosis in younger patients, are usually absent in old people, particularly if the disease is chronic. Helpful for a correct diagnosis are the examination of the sputum and the tuberculin reaction. Schlesinger considers roentgenoscopy the best diagnostic method. He points out that the general condition of the patient is often fair and that the resistance power of the organism is sometimes surprisingly good. However ,a correct diagnosis is very important, on account of the danger of infecting other persons, especially children, who come in contact with the patient. The therapy for tuberculosis in older persons should be mostly palliative. A fresh air cure according to Schlesinger, is very helpful, particularly in cases of cardiac insufficiency, anorexia and elevated temperature. Treatment with tuberculin is also of value. Theobromine preparations can be administered if the tuberculosis is complicated by cardiac weakness. If the patient shows lack of appetite, insulin may be helpful. The oral administration of medicaments should be discontinued in such cases because most of them decrease the appetite. A radical change in the habits and in the mode of life is not advisable for old people.

Finska Läkaresällskapets Handlingar, Helsingfors

70: 885-1004 (Nov.) 1928

Tuberculosis of Eyes and Physical Condition. V. Grönholm.—p. 885.
Transplantation of Fat in Enucleation of Eyes. J. G. Lindberg.—p. 898.
*Roentgen Treatment of Enlarged and Infected Tonsils. B. Nyström.—p. 903.
Does Professor E. Weber Overrate Significance of Shifting of Blood Due to Physical Exercise? D. Rancken.—p. 913.
New Theory of Hearing. F. Leiri.—p. 921.

Roentgen Treatment of Enlarged and Infected Tonsils.—Seventy-four cases were treated by Nyström in 1928. He usually treated the two outer fields, measuring about 5 by 6 cm., with one half of a Holzknecht erythema dose, copper filter of 0.5 mm. current of 2.5 ma., spark gap of 46 cm., and Coolidge tube. If necessary, the irradiation was repeated after a six weeks' interval, in exceptional cases three or four times. In the cases observed for from two to eight months, improvement was noted in thirty-two out of thirty-eight cases of chronic tonsillitis; decrease in the size of the tonsils was seen in two out of four cases of simple hypertrophy of the tonsils in children, aged from 2 to 8. The author considers roentgen treatment in chronic tonsillitis best suited to patients with moderately enlarged tonsils with an uneven surface and crypts or pus plugs; in most of these patients noticeable improvement was attained, often complete cure. With tonsils greatly enlarged but not yet infected, and in simple hypertrophy of the tonsils, as seen especially in children, roentgen treatment is advised only when operative treatment is contraindicated.

Hospitalstidende, Copenhagen

71: 1261-1288 (Nov. 22) 1928

Infiltrative Processes in Lungs of Tuberculous Children. E. Gjørup.—p. 1261. C'en.

71: 1289-1314 (Nov. 29) 1928

*Circulatory Changes in Skin After Irradiation with Various Sources of Light. H. Haxthausen.—p. 1289.

Circulatory Changes in Skin After Irradiation with Various Sources of Light.—Haxthausen finds that erythema after irradiation with ultraviolet rays is generally accompanied by a dilatation of the small arteries, which varies considerably according to the kind of light used. The temperature rise, which is as high as 2 degrees, is especially marked in erythemas with brief latent period. In addition to the rise in temperature on the spot irradiated, there is almost always an increase of temperature in the surrounding skin, probably a "reflex erythema." Comparison between the carbon arc and the mercury quartz light as to the effect of the "chemical" rays revealed no noticeable difference in the rise of temperature in the respective erythemas after either brief irradiation of skin not previously treated or prolonged irradiation of skin accustomed to the light. In contrast to the mercury quartz light, however, the carbon arc light produces a heat erythema which, judged by the rise in temperature, indicates a very considerable increase in the circulation of blood in the skin. The effect, often lasting more than twenty-four hours, seems to consist of (1) an "indirect" erythema, comparatively pale, very transitory, and partly reflex, apparently due chiefly to the dark heat rays, and (2) a "direct," more continued erythema of a darker red, limited to the irradiated area, and due to the penetrating heat rays. He says that these effects of the heat rays of the carbon arc light open new perspectives in its therapeutic superiority to the mercury quartz light, believed to have been noted clinically.

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